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STEEL

ESTABLISHED 1882

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STEEL
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As the Editor Views the News

■ LAST WEEK justice caught up with the national labor relations board. The Supreme Court ruled (p. 26) that the sitdown strike is illegal, that employers need not reinstate sitdowners, that workers who violate nonstrike agreements have no protection under the labor law, that courts have the power to examine proceedings in labor board cases to ascertain whether there is justification for the board's orders. These decisions are heartening to industry in that they reaffirm individual and property rights which had seemed threatened. . . . Business also is encouraged (p. 25) by assurances from leading administration spokesmen that emphasis has shifted from reform to recovery and that the administration "is now determined to promote recovery with all the vigor at its command."

• • •

Steel at Airports

Eastern steel companies, which last week (p. 17) obtained a court order temporarily postponing the effective date of the labor department's 62½-cent minimum wage ruling for their district, will be given a chance to prove that the injunction should be made permanent. . . . The rapidly increasing number of airplanes is creating a demand for more hangars which (p. 15) represent a growing market for steel and many products fabricated from metals; one recently completed hangar required 1300 tons of structural steel alone. . . . Business news is a little better. Steel production last week (p. 21) moved up one point to 56 per cent of ingot capacity. . . . Machine tool buying (p. 27) definitely is in an upswing. . . . Automobile assemblies (p. 30) are returning to a full-week basis.

• • •

Every Phase

Another good performance in the field of industrial relations is Bethlehem Steel Corp.'s annual report to employes. A 14-page pamphlet, the report interprets virtually every phase of the company's activities. . . . The schools of America constitute a rapidly growing market (p. 32) for steel in various fabricated forms. . . . The national defense bill, favorably reported by the senate military affairs committee, provides $34,500,000 (p. 26) for orders aimed at educating manufacturing companies in the production of essential war materials. . . . Harry L. Hopkins, secretary of commerce, has appointed a business executive, Gen. Robert E. Wood (p. 17) as his special assistant. . . . Labor troubles keep springing up here and there (p. 17) and show much remains to be done in employer-employe relations.

• • •

Men and Machines

Large attendance appears indicated for the coming annual meeting and exposition (p. 38) of the American Society of Tool Engineers at Detroit. Keynote of the program is to be the first formal report of the society's fact-finding study of the relationship of the machine to employment and standards of living. . . . Nelson W. Pickering, president, Farrel-Birmingham Co., Ansonia, Conn., is this week's contributor to STEEL's Forum on Re-Employment (p. 46). He recommends revised governmental policies that would result in wider employment. . . . From an authoritative source (p. 48) comes a roundup of recommended practices in fabricating stainless steel and cleaning it after fabrication and erection. . . . A new elastic nut (p. 74) proves useful in a wide variety of fastening applications.

• • •

Controls On Ground

A new system of revolving-top control permits all control to be at ground level (p. 54) and eliminates hazards to blast furnace workmen which exist when control is located at top. . . . A controlled atmosphere, continuous annealing furnace (p. 58) promotes physical characteristics and appearance of finish of strip steel. . . . Factors that affect the quality of castings were discussed (p. 62) at the regional foundry conference at Birmingham, Ala. . . . A unique steel mill handling system comprises 2½ miles of tramrail (p. 64); it handles the output of two rod mills. . . . Prime essentials for long life in bronze worm gears (p. 69) are lowest coefficient of expansion of friction with maximum physical properties. . . . A new airplane (p. 56) flies 2785 miles at a cost of $25.70.

E C Kreutzberg

A PATH OF STEEL TO THE MOON

Picture a glistening footpath of 20-gage steel, 18 inches wide, connecting your own doorstep with the moon — 238,883 miles away.

Inland's flat rolled steel capacity is now sufficient to produce that much tonnage in a single year, with adequate reserve for emergency additional orders that are always apt to arise and require prompt handling.

But the vast quantity—1,535,000 tons of flat rolled, annually—is far from being the whole story of Inland Sheets.

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Not surprising is the growing popularity of Inland Sheets and Strip and of the personal service that goes with them to assure promptness and uniform quality — every shipment.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Airport Hangars, Servicing

Present Growing Market for Structural Materials, Field, Shop Equipment

■ AMERICA'S 2380 public, private and military airports constitute a substantial market for steel and other metals. Large tonnages are required for facilities such as hangars, lighting, radio, power, servicing and shop equipment.

Among the large new projects now underway are a $30,000,000 New York world's fair air terminal at North Beach, and a $13,000,000 Washington national airport at Gravelly Point, Md.

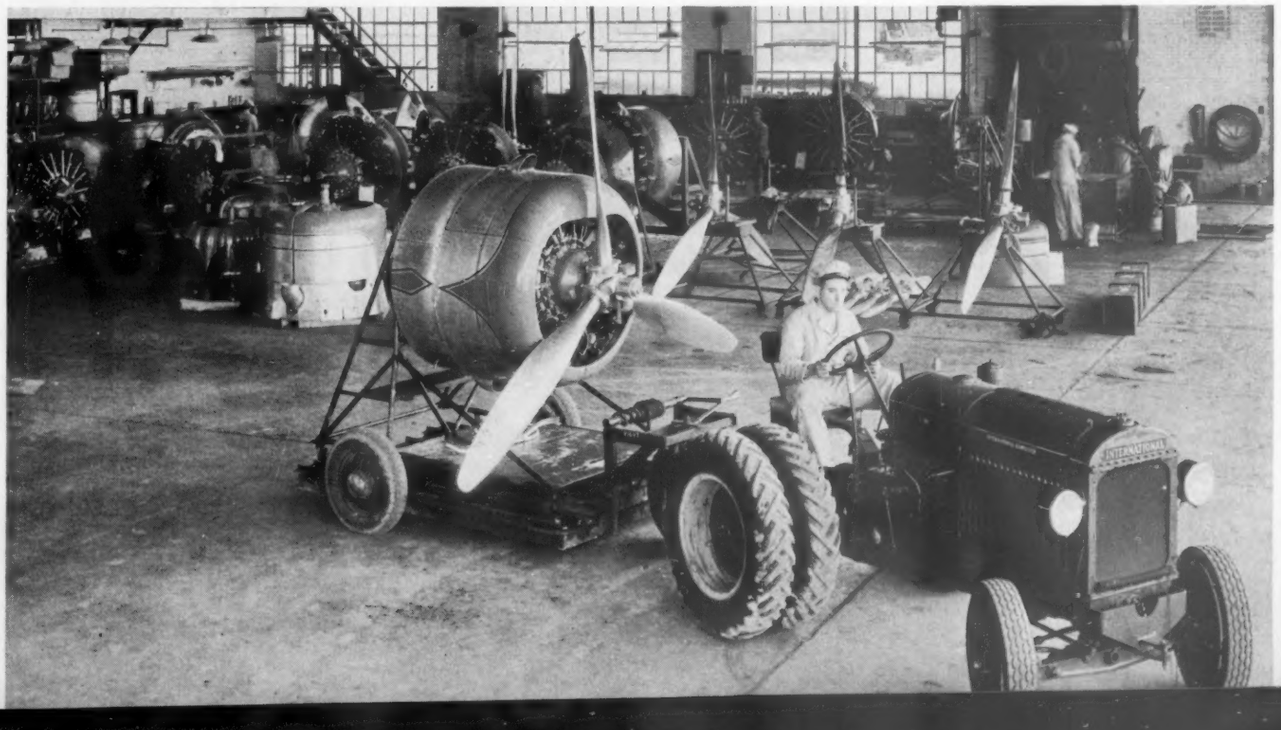
Construction of aircraft hangars requires considerable structural and sheet steel, in addition to glass and brick, concrete or tile.

Pan American Airways recently completed one new hangar for its transatlantic terminal at Baltimore which took about 1300 tons of steel, and two for its transpacific station on San Francisco's "Treasure Island," using 2100 tons. An 8000-ton structure now is being designed for the government.

Today's giant skyliners, some with wing spans exceeding 150 feet, demand larger hangars, with unobstructed floor space. One leading builder has been able to eliminate numerous columns, and at the same time to provide for future enlargement by using high-tensile steel structural members with a single jack-truss roof construction.

A new all-steel, multiple-type

■ **Expansible hangars, specially-designed snow removers and field apparatus, tractors, and many items of shop equipment figure in substantial steel requirements for airports. Photos, Austin Co., Klauer Mfg. Co., International Harvester Co.**



hangar which is easily expanded was announced recently by Multiple Hangar division of Edwards Iron Works Inc., South Bend, Ind. Planned for groups of private flyers, this hangar is assembled in units each of which houses a single plane.

Electric welding today is employed for more than half of all hangar steelwork. Used almost exclusively are sliding and canopy-type welded steel doors. Ten sets of such canopy doors, each 44 x 300 feet, and weighing in all about 1500 tons, are being built by Truscon Steel Co., Youngstown, O., for the New York airfield.

Large Electrical Purchases

Electrical equipment purchased by airports annually approximates $2,500,000, about half being for replacements. This total requires 500 tons of iron, steel, copper and aluminum.

Greatest electrical demand is in equipment to illuminate fields for night operations. Complete lighting requires location beacons, boundary markers, obstruction warnings and runway floodlights. Galvanized steel "contact lights" set flush with the ground are a recent development.

The larger ports need extensive radio facilities, some having a dozen individual two-way sets. Radio serves planes in flight with weather information, and controls traffic. In addition, automatic signals give continuous route and landing directions. Many fields now are equipped with radio teletypewriters and facsimile transmittors for communication with ground points.

Central control of this electrical equipment requires master switchboards, meters and instruments. Requisites for power systems are distribution and potential transformers. Some airports also are installing emergency gasoline generators.

Nearly every field which houses aircraft necessarily is equipped with facilities for repair work. Minimum equipment includes light metalworking tools, ignition testers, welders and battery chargers.

Several thousand mobile servicing units now are used on flying fields. These are specially-designed trucks or tractors fitted with fuel and oil dispensing tanks. Other automotive equipment includes high-speed fire and crash apparatus, and snow removers.

Miscellaneous requirements are manifold. For installation in administration buildings, airports are ordering air conditioning and ventilating systems, blowers, water coolers, office machinery and restaurant equipment.

As far as possible, field managers attempt to keep their ground gear abreast of technical developments. Lately much progress has been made with "blind landing" systems. To manufacture a new "air track" landing device, F. L. Jacobs Co. recently formed Air Track Mfg. Co., Detroit, with capital of $500,000.

Domestic airports are estimated to represent about a $2,000,000,000 investment. Of this, $330,000,000 comprises land improvements, buildings and equipment. Some 200 manufacturers supply requirements in this market.

An important buying group are the 18 scheduled transport lines, operating 203 air terminals. They employ 12,000 ground and flight personnel, and have a $25,000,000 annual payroll. Last year they flew nearly 1,500,000 passengers.

Maintain Complete Shops

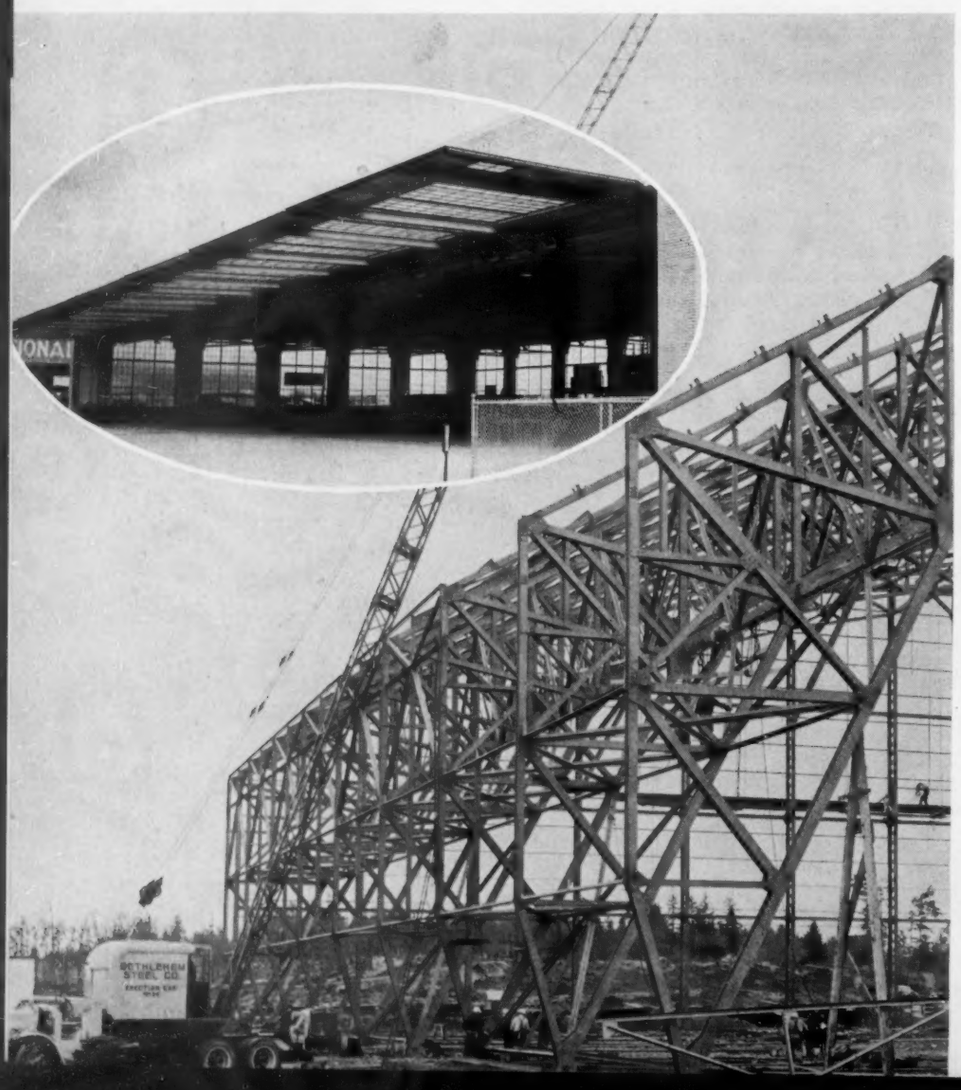
Each company has one or more bases for thoroughly overhauling its planes and engines. Here are found shops completely equipped with machine tools, riveters and welders, heat treating furnaces and conveying systems. Some apply the X-ray in metal strain analysis.

The commercial carriers and government jointly maintain a 35,000-mile Federal Airways System linking the airports. Along most of these routes are radio weather and communications stations, radio beacons, and rotating beacon lights. Beacon lights are at 15-mile intervals and stand on steel skeleton towers from 20 to 87 feet high. Usually they operate from gasoline generators.

Airports present an important and growing market for buildings and equipment. Many existing fields are lacking vital facilities despite recent expenditures by municipalities, airlines and WPA. More than two-thirds still are unlighted.

Large-scale federal subsidies for development of an enlarged "national airport system" may result from the civil aeronautics authority's report to congress on its newly-completed airport survey.

In line with the scheduled expansion of both private and military aviation, CAA is said to urge lengthening of runways, additional hangars, relocation of nearby hazards, doubling of present lighting facilities, and carefully planned increase in the number of fields.



■ **Thousands of tons of steel will go into this army hangar, reported to be the country's largest, now under way at McCord field, Ft. Lewis, Wash. Three more are scheduled. Using a cantilever truss roof construction, the structure will be 300 x 400 feet, with inside height of 100 feet. Photo, Thew Shovel Co. Steel canopy doors of the United Airlines hangar, Cleveland airport (inset), can be raised electrically in 58 seconds**

Walsh-Healey Wage Order in Effect; Three Get Temporary Court Restrainer

■ MINIMUM steel wages decreed by labor department under the Walsh-Healey act became effective March 1 despite a plea for a second postponement, made by small eastern producers.

Seven of these producers carried their case to the United States district court for the District of Columbia, and Justice Jennings Bailey granted a temporary restraining order until March 6 on behalf of three mills which were to bid on navy steel last week.

Charles V. McLaughlin, assistant labor secretary who has handled the steel wage hearings, sent a letter to Roberts B. Thomas, counsel for the eastern producers, stating he had given the matter ample consideration and found no need for a second postponement.

On the same day seven of the steel manufacturers went into the court asking a restraining order. The seven were Lukens Steel Co., Coatesville, Pa.; Alan Wood Steel Co., Conshohocken, Pa.; South Chester Tube Co., Chester. Pa.; Central Iron & Steel Co., Harrisburg, Pa.; the Harrisburg Steel Corp., Harrisburg, Pa.; the Eastern Rolling Mill Co., Colgate, Md.; and Atlantic Wire Co., Branford, Conn.

Three Granted Injunction

The restraining order granted by the court applies only to Lukens, Alan Wood and Central Iron & Steel. All said they were to bid last week on 7500 tons of steel plates for the cruiser ALABAMA and the restraining order was granted until March 6 when a hearing will be held for a permanent injunction. Justice Bailey set bond at $25,000.

Arguments for the injunction were presented by O. Max Gardner, former North Carolina governor and Thomas. Also appearing to support the independents' complaint was Rep. Francis E. Walter, Pennsylvania, who told the court that if the determinations were allowed to go into effect as ordered, it would mean "destruction" of the Walsh-Healey act and "arbitrary misinterpretation" of the intent of congress in enacting the legislation.

Representing the labor department were Solicitor Gerard D. Reilly and H. L. Underwood, assistant United States attorney. The latter argued the secretary's determinations were based on comprehensive evidence submitted to the department's public contracts division by th steel industry, and that the effective date of the determinations should not be delayed because of the small number of government contracts being handled by the petitioning firms.

Lee Pressman, representing Steel Workers Organizing committee, urged the court to refuse the restraining order on the ground wage increases would be denied a significant number of men.

The court's order restrained not only the secretary of labor, but also the secretary of war, secretary of treasury, secretary of navy, the postmaster-general and the secretary of interior.

"Locality" Major Issue

Major issue in the hearing was whether the secretary of labor had properly interpreted the word "locality" as used in the Walsh-Healey act. Complainants' counsel and Representative Walter declared the term could not justly be construed to cover such a large section as the 13-state area in which the labor secretary had ordered the 62½-cent minimum.

They argued that for more than 50 years there has existed in the iron and steel industry a natural economic wage differential between the eastern producing section and the Pittsburgh-Ohio-Chicago area, and that to group the eastern section with the Pittsburgh-Ohio-Chicago area, as the department did in its determinations, would completely destroy the wage adjustment which the steel industry itself had created.

STEEL HEARINGS DELAYED, WILL START THIS WEEK

Federal trade commission did not reach the steel industry last week in presenting its case before the temporary national economic committee. Steel now is scheduled to be discussed by commission experts March 6, with Eugene W. Burr, FTC attorney, as first witness. Two or three days will be required to cover the steel industry in the commission's studies.

Commission experts spent last week reviewing the past seven years' investigations of monopolistic tendencies. Many industries were mentioned; details were disclosed in none.

HOPKINS MAY CALL MORE BUSINESS EXECUTIVES

Harry L. Hopkins, secretary of commerce, announced last Friday that Gen. Robert E. Wood, chairman, Sears-Roebuck Co., will be his special assistant for a 4-month period, starting March 28. While General Wood's duties have not been announced, it is reported he will act as liaison officer between government and business. Other business executives may be appointed in similar capacities later.

LABOR

STEEL EMPLOYMENT HIGHEST IN TEN MONTHS

■ NEARLY 451,000 were employed in the steel industry in January, the highest number in ten months, according to the American Iron and Steel institute. This number compares with 449,000 in December, and 475,000 in January a year ago. Steel payrolls totaled $59,348,000, against $59,254,000 in December, and $47,578,000 in January, 1938.

Earnings of the 394,000 wage earners in January averaged 82.6 cents per hour. In December the average was 83.5, and in January, 1938 it was 80.5.

Wage earners worked an average of 32 hours per week in both January and December; 22.9 in January last year.

SWOC REJECTS WAGE CUT; STRIKE CLOSES FOUNDRY

Pittsburgh Steel Foundry Corp., Pittsburgh, was closed last week after the Steel Workers Organizing committee rejected a proposed 15 per cent wage reduction, voted to strike.

Contract with the union was terminated last Thursday at midnight after 20-day notice by the company. The reduction, said company officials, was necessary to prevent recurrence of last year's $280,000 loss. They offered to restore wages after three months' operation in the black.

SWOC agreed not to picket; company agreed not to attempt to operate.

SIX HURT, AUTOS STONED IN CLAIRTON DUES-PICKETING

Dues-picketing by Steel Workers Organizing committee members at Carnegie-Illinois Steel Corp.'s coke and steelworks, Clairton, Pa., last week resulted in injury to six persons, damage to 13 automobiles. Plant operations were not disrupted.

VOTE 700 TO 10 AGAINST AFL OR CIO AFFILIATION

Members of the Workmen's Federal Wagner union at Allis-Chalmers Mfg. Co.'s La Porte, Ind., plant have decided by a vote of 700 to 10 to continue as an independent organization, and not to affiliate with AFL or CIO. The union, formed nearly three years ago, is sole bargaining medium with the company.

Pig Iron Output in February Up 4.8 Per Cent; Gain of 3 Stacks

■ PRODUCTION of coke pig iron turned upward in February following two months of decline. Operating blast furnaces increased to 121 on the last day of the month, as compared with 118 on Jan. 31. These gains, although small, lifted activity to near the November level which was the peak for 1938.

Daily average output of iron in February was 73,543 gross tons, an improvement of 3368 tons per day, or 4.8 per cent, over the January production of 70,175 tons. This was the best daily rate since November with 76,222 tons. In February, one year ago, the daily rate was only 46,655 tons.

MONTHLY IRON PRODUCTION

Gross Tons

	1939	1938	1937
Jan.	2,175,423	1,444,862	3,219,741
Feb.	2,059,203	1,306,333	3,020,006
Tot. 2 mo.	4,234,626	2,751,195	6,239,747
March	.....	1,470,211	3,470,470
April	.....	1,388,008	3,400,636
May	.....	1,260,937	3,545,180
June	.....	1,060,747	3,115,302
July	.....	1,213,076	3,501,359
Aug.	.....	1,495,514	3,616,954
Sept.	.....	1,683,097	3,417,960
Oct.	.....	2,067,499	2,891,026
Nov.	.....	2,286,661	2,007,031
Dec.	.....	2,212,718	1,503,474
Total	4,234,626	18,889,663	36,709,139

Total production for February was 2,059,203 tons, which compared with the 2,175,423 tons of January, was a drop of 116,220 tons, or 5.4 per cent. This is accounted for, however, by the fact that February was a 3-day shorter month than January. Production in February, 1938, amounted to only 1,306,333 tons.

Output for the first two months of 1939 aggregated 4,234,626 gross tons, against 2,751,195 tons for the corresponding two months in 1938. The increase of 1,483,431 tons amounts to 54 per cent.

Relating production to capacity, and using the American Iron and Steel institute's recently announced capacity figure of 50,198,920 gross tons as of Dec. 31, 1938, operations in February averaged 53.5 per cent. This was the best since last November with 55 per cent. Operations in February a year ago were 33.6 per cent.

Increased steelworks activity was responsible for the gain of 3 blast furnaces in February. Six steelworks or nonmerchant stacks resumed and 2 were blown out or banked, making a net gain of 4. One merchant stack was made active and 2 were taken off, with a net loss of 1 unit. The 121 furnaces blowing on Feb. 28 equaled the number making iron on Nov. 30, the highest point for 1938 and, in fact, the best for any month since October, 1937, with 151. Only 91 furnaces were operating at the close of February, 1938.

AVERAGE DAILY PRODUCTION

Gross Tons

	1939	1938	1937	1936
Jan.	70,175	46,608	103,863	65,461
Feb.	73,543	46,655	107,857	63,411
March	.....	47,426	111,951	66,004
April	.....	46,267	113,354	80,316
May	.....	40,675	114,360	85,795
June	.....	35,358	103,843	86,551
July	.....	39,131	112,947	83,735
Aug.	.....	48,242	116,676	87,475
Sept.	.....	56,103	113,932	90,942
Oct.	.....	66,694	93,259	96,509
Nov.	.....	76,222	66,901	98,331
Dec.	.....	71,378	48,499	100,813
Ave.	71,773	51,752	100,573	83,832

Furnaces blown in during February were: In Colorado: Minnequa D, Colorado Fuel & Iron Corp. In Illinois: South Works Old No. 2, Carnegie-Illinois Steel Corp. In Ohio: Trumbull-Cliffs, Trumbull-Cliffs Furnace Co. In Pennsylvania: Palmerton No. 2, New Jersey Zinc Co.; Clairton Nos. 3 and 4, Carnegie-Illinois Steel Corp. In West Virginia: Riverside, Wheeling Steel Corp.

Stacks blown out or banked were: In Alabama: Woodward No. 1, Woodward Iron Co. In New York: One Buffalo, Republic Steel Corp. In Ohio: Mary, Sharon Steel Corp.; Anna, Struthers Iron & Steel Co.

FEBRUARY IRON PRODUCTION

	No. in blast last day of Feb.	Jan.	Total tonnage Merchant	Nonmerchant
Alabama	15	16	70,717	151,140
Illinois	9	8	31,954	139,050
New York	9	10	44,700	86,601
Ohio	28	29	75,314	420,059
Penna.	34	31	33,674*	520,650*
Colorado	2	1	2,939*	318,506
Indiana	9	9		
Maryland	4	4		
Virginia	1	1		
Kentucky	1	1	10,454	153,445
Mass.	0	0		
Michigan	4	4		
Minnesota	1	1		
Missouri	0	0		
Tenn.	0	0		
Utah	1	1		
West Va.	3	2		
Total	121	118	269,752*	1,789,451*

*Includes ferro and spiegeleisen.

Canada Exports More to U.S. Under Trade Treaty

■ Canada's exports to the United States in January, first month under the new trade agreement, totaled $36,277,000, an increase of 75 per cent over $20,733,000 exported a year ago. Exports to all nations increased 14.1 per cent. Part of the increase is attributed to December shipments being held back for more favorable duties.

Imports from the United States into Canada were valued at $28,790,000, 11 per cent larger than in January, 1938.

RATE OF OPERATION

(Relation of Production to Capacity)

	1939[1]	1938[2]	1937[3]	1936[4]
Jan.	51.0	33.6	76.6	48.2
Feb.	53.5	33.6	79.5	46.4
March	....	34.2	82.5	48.5
April	....	33.4	83.7	59.1
May	....	29.4	84.3	63.1
June	....	25.5	76.6	63.6
July	....	28.2	82.9	61.5
Aug.	....	34.8	85.7	64.3
Sept.	....	40.5	83.7	66.9
Oct.	....	48.0	68.4	71.0
Nov.	....	55.0	49.3	72.3
Dec.	....	51.4	35.6	74.2

[1] Based on capacity of 50,198,920 gross tons, Dec. 31, 1938; [2] capacity of 50,606,400 gross tons, Dec. 31, 1937; [3] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [4] capacity of 49,777,893 tons, Dec. 31, 1935. Capacities by American Iron and Steel Institute.

New Features in Ninth Stainless Zephyr

■ Chicago, Burlington & Quincy railroad will place its ninth stainless steel streamlined Zephyr, "General Pershing", in service early in April between St. Louis and Kansas City. Edward G. Budd Mfg. Co., Philadelphia, is now building the train.

New features include a lighting, heating and air conditioning unit under each car, independently diesel-operated. Braking is by a new system, using disks inside the wheels instead of shoes on the treads. Lighting will be by a fluorescent system developed by General Electric Co. Sway on curves will be reduced by roll stabilizers.

■ Mechanical coal stoker sales declined 5.3 per cent in 1938 compared with 1937, but increased 12 per cent over 1936, according to the department of commerce. Sales in December increased slightly over the same month in 1937, with a total of 4971 compared with 4609.

Bethlehem Compares Pay Averages In Pamphlet "Report to Employes"

■ BETHLEHEM STEEL CORP.'S 14-page pamphlet "Annual Report to Employes," issued last week, interprets virtually every phase of its operations.

High wages and maintenance of good relations between employes and management are emphasized. More than $117,000,000 was paid in wages and salaries in 1938, 44.3 per cent of the total $265,000,000 received for goods and services.

"Figures recently published show that in 1938 the average earnings per hour of Bethlehem employes were 91.2 cents, compared with 90.2 cents for employes of the United States Steel Corp., the largest producer in the industry," the report states, adding that "this comparison is an indication of the favorable position of Bethlehem's wage level in the steel industry."

The report points out that, eliminating over 10,000 administrative, sales, supervisory, clerical and other salaried employes, the company in 1938 paid its hourly workers an average of 83.1 cents per hour, compared with an average of 71.4 cents per hour paid by 25 major industries, as reported by the National Industrial Conference board. "This is a 16 per cent advantage."

In the report is a letter from E. G. Grace, president, "To the Employes," in which he says:

"Bethlehem has always endeavored to pay the highest wages possible. The average earnings per hour of Bethlehem employes compare favorably with those of our major competition and rank well above the average of other leading manufacturing industries . . .

"Bethlehem has enjoyed many years of industrial peace. The policy of fair play, collective bargaining, mutual understanding and progressive practices has been characteristic of industrial relations in Bethlehem, and has set a high standard comparable to the best practices of industry as a whole. This relationship has been an important factor in making possible the high wages and good working conditions which prevail with us."

Continue Pension Payments

During 1938 disbursements made under the company's pension plan amounted to $769,313, bringing the total of pensions paid since the plan's inception in 1923 to $10,007,667.

Disbursements under the Bethlehem relief plan in 1938 amounted to $1,400,505, disability benefits having been paid to 7300 employes at rates of from $10 to $12 a week, and 775 beneficiaries having received death benefits of $500, $1000 or $1500. At the close of the year 85,240 employes were participating in this plan. Since it was started in 1926 relief payments have totaled $13,441,040. Relief and pension payments together total $23,448,000.

The cost of vacations with pay for wage earners last year was $1,253,639. Vacations will be continued in 1939.

Thirty-nine and six-tenths per cent of Bethlehem employes are over 40 years of age; 3.3 per cent are 18 or 19; 29.3 per cent from 20 to 29 years old; 27.8 per cent from 30 to 39.

Accident frequency in 1938 was 12.9 per cent lower than in 1937, and 81.1 per cent lower than in 1916 when safety activities were inaugurated.

The report also presents a consolidated income statement of the corporation for 1938.

"Manifestly, a fair return to stockholders on their investment is essential for the continuance of any business," it states. "The common stock of Bethlehem represents an investment of over $365,000,000. This and other investments in bonds, debentures and preferred stock have made possible the Bethlehem of today.

"Additional investment will be required from time to time to maintain Bethlehem's position in the industry and thus to preserve the jobs of the present employes and to create new jobs. Naturally no one will invest additional money in securities of a corporation without the expectation of a reasonable return on it and this is just as true of common stock as it is of other kinds of securities."

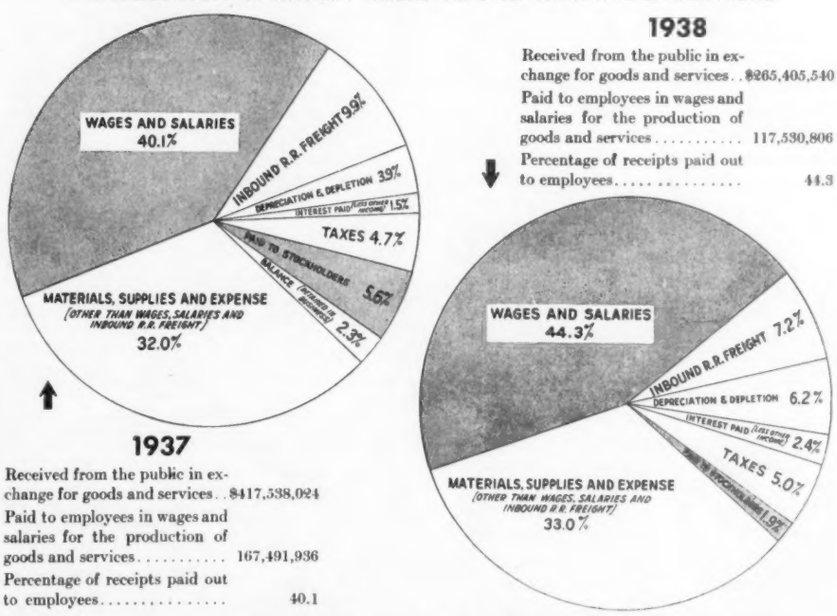
Property Purchases Significant

The report states the significance of Bethlehem's acquisition during 1938 of the properties of International Supply Co., and United Shipyards Inc. The first gives expanded outlets for products used in the oil fields, while United's four ship-repair yards provide access to the ship-repair business of the Port of New York, and also additional facilities for shipbuilding.

Several important additions to steel plants, rounding out the company's recent $90,000,000 program for new facilities, are enumerated. Among these: Increasing capacity for open-hearth steel, Los Angeles plant; new galvanizing department for sheets at Lackawanna; an additional electric furnace at Bethlehem plant; new axle shop at Cambria plant; more wire-drawing equipment at Maryland plant.

■ Second poster series, designed to promote re-employment and sponsored by National Association of Manufacturers, is being posted on 15,000 panels throughout the country. Current display depicts marching, banner-bearing men and women, carries the slogans, "Let's All Work Together" and "Busy Factories—More Jobs".

DISTRIBUTION OF MONEY RECEIVED FOR GOODS AND SERVICES


1937
WAGES AND SALARIES 40.1%
INBOUND R.R. FREIGHT 9.9%
DEPRECIATION & DEPLETION 3.9%
INTEREST PAID (LESS OTHER INCOME) 1.5%
TAXES 4.7%
PAID TO STOCKHOLDERS 5.6%
BALANCE (RETAINED IN BUSINESS) 2.3%
MATERIALS, SUPPLIES AND EXPENSE (OTHER THAN WAGES, SALARIES AND INBOUND R.R. FREIGHT) 32.0%
1938
WAGES AND SALARIES 44.3%
INBOUND R.R. FREIGHT 7.2%
DEPRECIATION & DEPLETION 6.2%
INTEREST PAID (LESS OTHER INCOME) 2.4%
TAXES 5.0%
PAID TO STOCKHOLDERS 1.9%
MATERIALS, SUPPLIES AND EXPENSE (OTHER THAN WAGES, SALARIES AND INBOUND R.R. FREIGHT) 33.0%

1937

Received from the public in exchange for goods and services	$417,538,024
Paid to employees in wages and salaries for the production of goods and services	167,491,936
Percentage of receipts paid out to employees	40.1

1938

Received from the public in exchange for goods and services	$265,405,540
Paid to employees in wages and salaries for the production of goods and services	117,530,806
Percentage of receipts paid out to employees	44.3

■ **Tables, charts, maps, feature Bethlehem Steel's "Annual Report to Employes." One of the most significant exhibits is this, showing distribution of its income**

January Imports Gain 9 Per Cent

■ STEEL and iron imports in January, scrap excluded, totaled 24,331 gross tons valued at $1,729,145, an increase of 2083 tons and $323,441 in value over December, according to the metals and minerals division, department of commerce. This is a gain of 9 per cent in quantity, and 23 per cent in value. In January, 1938, imports were 29,409 tons, valued at $1,680,955.

Germany was the principal supplier last month, with 8829 tons, the largest item being 6393 tons of miscellaneous pipe. Belgium was second with 7252 tons, including 2923 tons of structurals, 1601 tons of hoops, 1584 tons of bars.

Scrap imports in January totaled 3333 tons valued at $30,707, compared with 6519 tons valued at $76,649 in December, and 222 tons valued at $6632 in January, 1938. Canada supplied 3322 tons last month.

Exports of several iron and steel classifications increased in January. This was in contrast to the decline in total exports, excluding scrap, from 166,404 gross tons in December to 134,788 tons in January, as reported in STEEL, Feb. 27, page 21.

The leading item in January exports was nonalloy black steel sheets, 24,268 tons, compared with 23,428 tons in December.

January steel ingot exports were 13,366 tons, and 10,197 tons in December. Tin plate shipments also gained, 12,670 tons in January against 10,578 tons in December.

January scrap exports totaled 227,884 tons, including 153,331 tons to Japan; 26,055 tons to Italy; 23,190 tons to Netherlands, and 11,635 tons to Germany.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1939		1938	
	Exports	Imports	Exports	Imports
Jan.	362,672	27,664	586,294	29,631
Feb.	.....	.....	460,640	19,589
March	.....	.....	526,883	11,827
April	.....	.....	489,202	21,237
May	.....	.....	540,639	20,814
June	.....	.....	312,021	15,887
July	.....	.....	263,699	14,728
Aug.	.....	.....	242,139	20,041
Sept.	.....	.....	346,068	27,958
Oct.	.....	.....	425,431	26,445
Nov.	.....	.....	646,157	27,627
Dec.	.....	.....	490,095	28,767
Total	.....	.....	5,152,707	264,551

ORIGIN OF JANUARY IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	14,944	.....	.....	1,302
Sweden	7,080	.....	.....	22
Mexico	610	.....	.....	.....
Canada	60	162	13	.....
Cuba	35,003	.....	2,843	.....
Chile	118,500	.....	23	.....
Australia	3,504	.....	.....	.....
Iran	10	.....	.....	.....
Netherlands	.....	222	.....	1,098
British India	.....	202	.....	.....
Soviet Russia	.....	.....	3,250	.....
South Africa	.....	.....	1,688	.....
Gold Coast	.....	.....	1,849	.....
France	.....	.....	.....	84
Czechoslovakia	.....	.....	.....	644
Total	179,711	586	9,666	3,150

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	26	2,923	1,584	1,601
France	140	526	197	185
United Kingdom	4	5	3	.....
Canada	1	4	5	.....
Germany	.....	76	315	107
Sweden	.....	.....	77	1
Czechoslovakia	.....	.....	7	.....
Total	171	3,534	2,188	1,894

U. S. IMPORTS OF IRON AND STEEL PRODUCTS FOR CONSUMPTION

Gross Tons

Articles	Jan. 1939	Dec. 1938	Jan. 1938
Pig iron	586	1,237	9,747
Sponge iron	34	83	11
Ferromanganese (1)	3,150	4,333	647
Spiegeleisen	976	2,440	125
Ferrochrome (2)	.....	21	20
Ferrosilicon (3)	74	251	56
Other ferroalloys (4)	25	25	1
Steel ingots, blooms	1	.....	.....
Billets	7	37	233
Concrete reinfor. bars	365	317	45
Hollow bar, drill steel	100	48	125
Bars, solid or hollow	2,188	1,854	1,854
Iron slabs	.....	.....	.....
Iron bars	50	20	10
Wire rods	1,196	480	504
Boiler and other plate	.....	1	4
Sheets, skelp, saw plate	171	34	421
Die blocks or blanks	.....	3	3
Tin plate, taggers' tin and terne plate	3	7	1
Structural shapes	3,534	3,621	3,147
Sashes and frames	.....	.....	.....
Sheet piling	.....	.....	.....
Rails and fastenings	241	281	184
Cast iron pipe and fittings	32	171	201
Malleable iron pipe fit'gs.	.....	.....	11
Welded pipe	270	515	301
Other pipe	6,550	1,729	4,760
Cotton ties	2	.....	19
Other hoops, bands	1,894	2,143	2,177
Barbed wire	1,012	738	3,242
Round iron and steel wire	285	264	73
Telegraph, telephone wire	1	11	.....
Flat wire and steel strips	270	295	263
Wire rope and strand	240	114	213
Other wire	240	73	259
Nails, tacks and staples	553	677	536
Bolts, nuts and rivets	12	5	12
Horse and mule shoes	45	24	31
Castings and forgings	224	396	173
Total, gross tons	24,331	22,248	29,409
Iron and steel scrap	3,333	6,519	222
GRAND TOTAL	27,664	28,767	29,631

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Jan. 1939	Dec. 1938	Jan. 1938
Pig iron	6,325	20,622	35,997
Ferromanganese and spiegeleisen	.....	3	2
Other ferroalloys	103	149	189
Ingots, blooms, etc.:			
Not containing alloy	13,366	10,197	37,551
Alloy, incl. stainless	981	198	88
Steel bars, cold fin.	1,290	1,134	219
Bars, iron	61	37	349
Bars, concrete	2,471	1,699	1,761
Other steel bars:			
Not containing alloy	6,921	8,431	16,383
Stainless steel	11	117	9
Alloy, not stainless	1,352	2,393	545
Wire rods	353	307	2,488
Boiler plate	1,118	348	287
Other plates, not fab:			
Not containing alloy	9,751	19,926	26,038
Stainless steel	3	17	10
Alloy, not stainless	38	58	288
Skelp iron or steel	742	7,439	621
Sheets, galv. iron	429	229	176
Sheets, galv. steel	7,326	7,279	3,938
Sheets, "black" steel	.....	.....	.....
Not containing alloy	24,268	23,428	16,570
Stainless steel	52	60	79
Alloy, not stainless	347	150	871
Sheets, black iron	576	866	649
Strip steel, cold-rolled:			
Not containing alloy	1,977	2,335	2,232
Stainless steel	56	62	98
Alloy, not stainless	11	31	6
Strip steel, hot-rolled:			
Not containing alloy	5,080	4,355	3,612
Stainless steel	100	.....	6
Alloy, not stainless	1	24	9
Tin plate, taggers' tin	12,670	10,578	19,073
Terne plate	158	307	1,080
Tanks, except lined	1,442	2,228	5,083
Shapes, not fabricated	5,404	5,733	9,738
Shapes, fabricated	1,418	2,712	4,854
Plates, fabricated	147	99	830
Metal lath	79	76	75
Frames and sashes	41	113	65
Sheet piling	167	104	843
Rails, 60 lbs.	2,912	4,283	12,703
Rails, under 60 lbs.	85	116	4
Rails, relaying	182	599	467
Rail fastenings	642	385	922
Switches, frogs, crsgs.	183	45	217
Railroad spikes	107	223	178
Railr'd bolts, nuts, etc.	73	148	106
Boiler tubes, seamless	385	328	410
Boiler tubes, welded	8	40	3
Pipe:			
Smls. casing, oil line	3,229	3,490	4,484
Do., welded	293	592	1,067
Smls. black, casg.	741	858	393
Pipe fittings:			
Malleable iron screwed	309	304	208
Cast iron screwed	85	138	168
Pipe and fittings for:			
Cast iron pressure	2,054	1,112	568
Cast iron soil	635	874	847
Pipe, welded:			
Black steel	1,190	1,025	1,081
Black wrought iron	492	192	231
Galvanized steel	1,496	2,143	852
Galv. wrought iron	203	640	194
*Pipe and fittings	248	2	840
Wire:			
Plain iron or steel	2,022	2,075	1,698
Galvanized	2,118	2,532	1,861
Barbed	2,379	3,070	823
Woven-wire fencing	207	248	142
Woven-wire screen cloth:			
Insect	34	23	15
Other	109	88	54
Wire rope and cable	242	342	305
Wire strand	40	59	88
Electric welding rods	88	134	72
Card clothing	6	14	1
Other wire	570	726	502
Wire nails	1,528	2,599	825
Horseshoe nails	66	90	114
Tacks	13	25	10
Other nails, staples	309	188	145
Bolts, machine screws	586	749	700
Castings:			
Gray iron, semi-steel	259	335	260
Malleable iron	120	96	253
Steel, not alloy	36	74	67
Alloy, incl. stainless	78	246	29
Car wheels, tires, axles:			
†Car wheels and tires	791	579	2,561
†Car axles, no wheels	570	.....	.....
†Car axles with wheels	24	.....	.....
Horseshoes and calks	1	5	2
Forgings, n.e.s.:			
Not containing alloy	379	671	516
Alloy incl. stainless	8	54	59
Total	134,788	166,404	229,757
Scrap, iron and steel	225,434	321,261	355,781
Scrap, tin plate	857	1,149	514
Tin plate circles, strips, cobbles, etc.	782	730	96
Waste-waste tin plate	811	551	146
Total scrap	227,884	323,691	356,537
GRAND TOTAL	362,672	490,095	586,294
Iron ore	244	8,762	115

*New class. Includes flanged malleable cast iron fittings, expansion joints, and riveted pipe and fittings.
†New class.

FINANCIAL

MESTA'S PROFIT $2,909,957; NEW BUSINESS BETTER

■ MESTA MACHINE CO., Pittsburgh, reports net profit of $2,909,957, equal to $2.91 a common share, for 1938, compared with $4,668,029, or $4.67 a share in 1937.

Lorenz Iversen, president, states business improved steadily in the first two months this year. Unfilled orders Dec. 31 amounted to $7,832,525, compared with $13,074,460 carried over from 1937. Considerable part of current bookings are for export shipment.

♦

American Steel Foundries, Chicago, reports a net loss of $1,750,235 for 1938. In 1937, net income was $3,617,761.

♦

Sharon Steel Corp., Sharon, Pa., experienced a net loss of $95,324 for 1938, against a net profit of $1,345,810, equal to $2.83 a common share, in 1937. Henry A. Roemer, chairman and president, reports new business thus far this year is substantially larger than the early part of last year.

♦

Laclede Steel Co., St. Louis, for 1938 reports net profit of $331,849, equal to 1.61 cents a share. In 1937 net profit was $455,729, equal to $2.20 a share.

♦

Koppers Co., Pittsburgh, had a consolidated net profit of $1,159,805 in 1938, compared with net profit of $3,374,589 in 1937.

♦

Eastern Rolling Mill Co., Baltimore, Md., had a net loss of $375,871 in 1938. In 1937 net profit was $121,667, equal to 58 cents a share.

DIVIDENDS DECLARED

Youngstown Sheet & Tube Co., Youngstown, O., has declared the regular quarterly dividend of $1.37½ a share on preferred stock, payable April 1 to stock of record March 11. Annual meeting of shareholders will be held April 25.

♦

Carpenter Steel Co., Reading, Pa., has declared a dividend of 15 cents a share on common stock, payable March 20 to record of March 10. The company paid 10 cents a share on March 21 of last year.

INLAND TO VOTE MARCH 31 ON WILSON-BENNETT MERGER

Inland Steel Co. stockholders will meet March 31 to vote on the plan to acquire all outstanding common stock of Wilson & Bennett Mfg. Co., Chicago, in exchange for 45,000 shares of Inland's common. On the basis of present market prices, Inland is paying approximately $4,000,000 for Wilson & Bennett, manufacturers of steel containers. Stockholders also will vote on increasing Inland's authorized capital stock to 1,650,000 shares from the present 1,600,000.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Mar. 4	Change	Same week 1938	Same week 1937
Pittsburgh	50	+ 2	27	88
Chicago	56.5	+ 3	26.5	81
Eastern Pa.	37	None	30	57
Youngstown	47	None	29	84
Wheeling	71	+ 3	38	96
Cleveland	51	— 3	28	79.5
Buffalo	32.5	None	21	90
Birmingham	83	None	58	77
New England	60	—10	15	97
Cincinnati	55	None	10	64
St. Louis	55	None	28	82
Detroit	76	—10	35	100
Average	56	+ 1	29.5	86

Harvester Modernization To Exceed $12,000,000

■ Modernization programs recently announced by International Harvester Co. aggregate more than $12,000,000. Last week the company announced it will spend $3,000,000 on its Chicago tractor plant and that work has been started on a $275,000 to $350,000 project to house the Cincinnati truck division.

Earlier the company disclosed a $3,000,000 program for its Milwaukee works, a $5,000,000 improvement program at the Rock Island, Ill., tractor plant, and $1,000,000 to complete a foundry at the motor truck plant in Indianapolis.

Machinery Exports Down 20 Per Cent in January

■ Value of industrial machinery exports in January, $18,038,333, was 20 per cent less than the $22,456,170 in the month last year, according to machinery division, commerce department.

Metalworking machinery advanced. Power-driven metalworking exports, $6,340,620, were 6 per cent over $5,968,604 a year ago. Metalworking machinery exports other than power-driven, $332,635, were 12 per cent over $297,761 in January, 1938.

Power generating machinery exports totaled $746,076, only 21 per cent of the value in January last year. Construction and conveying equipment declined 24 per cent, mining, well and pumping equipment 3 per cent, textile, sewing and shoe machinery 36 per cent, and printing and bookbinding 8 per cent.

PRODUCTION

■ STEELWORKS operations last week advanced 1 point to 56 per cent, continuing the steady rise which started early in February. In the corresponding week a year ago the rate was 29.5; two years ago, 86.

Youngstown, O.—Held at 47 per cent, Carnegie-Illinois Steel Corp. dropping one open hearth and Republic Steel Corp. adding one. Three bessemers and 40 open hearths are active. A small gain is expected this week.

Cleveland—Down 3 points to 51 per cent. Addition of an open hearth by one interest is expected this week.

Chicago — Advanced 3 points to 56.5 per cent, highest since the week of Dec. 24, but 3.5 points below the 1938 peak of 60 per cent in November and December. A year ago the rate was 26.5 per cent. Two blast furnaces have been added by Carnegie-Illinois Steel Corp., one at Gary and one at South Chicago.

St. Louis—Steady at 55 per cent for third consecutive week.

Central eastern seaboard — Unchanged at 37 per cent.

Cincinnati — Held at 55 per cent for the fifth week.

New England — Off 10 points to 60 per cent. Return of one open hearth this week will replace part of this loss.

Birmingham, Ala. — Continued at 83 per cent for the third week. Same rate is scheduled this week.

Pittsburgh—Up 2 points to 50 per cent, with expectation of the same or a better rate this week.

Wheeling — Increased 3 points to 71 per cent.

Detroit — Dropped 10 points to 76 per cent as three open hearths were taken off at Ford plant. The other producer continues 12 of its 16 furnaces.

Buffalo—Held at 32.5 per cent.

Forecast 50 Per Cent Steel Increase in 1939

■ Steel production this year will be 50 per cent higher than in 1938, R. J. Wysor, president, and Norris J. Clarke, vice president, Republic Steel Corp., estimated at the annual conference dinner of Truscon Steel Co. in Youngstown, O., recently. Construction industry, for which Truscon furnishes much material, they said, is expected to do better than the steel industry. As steel operations in 1938 were at about 40 per cent of capacity the forecast indicates a 60 per cent average for 1939.

MEN OF INDUSTRY

■ MALCOLM W. REED, heretofore vice president in charge of operations, American Steel & Wire Co., Cleveland, has been appointed chief engineer, Carnegie-Illinois Steel Corp., Pittsburgh. He succeeds Sydney Dillon, who has been transferred to the office of the chief engineer, United States Steel Corp. of Delaware.

A graduate of the United States Naval academy in 1916, Mr. Reed joined American Steel & Wire in that year as a wire rope tester at the North works, Worcester, Mass. Two years later he went to the New Haven, Conn., plant, and advanced to the superintendency before going back to Worcester as assistant district manager. In September, 1932, Mr. Reed was transferred to Cleveland as chief engineer; a year later was appointed assistant to the vice president and chief engineer, and in January, 1937, became vice president in charge of operations.

Mr. Dillon, at the age of 12, began as a messenger and mail boy at Edgar Thomson works, subsequently becoming blueprint boy, tracer, draftsman, assistant chief engineer, and chief engineer. In November, 1916, he was made chief mechanical engineer for Carnegie Steel Co., continuing in that position until his appointment as assistant to vice president in September, 1930. Upon formation of Carnegie-Illinois, Mr. Dillon was made chief engineer. He is a member, American Iron and Steel institute, American Society of Mechanical Engineers, Engineers' Society of Western Pennsylvania.

♦

Walter Robbins has resigned as chairman and a director, General Cable Corp., Pittsburgh, which position he held since June, 1929.

♦

Joseph W. Johnson, one of the founders of Snap-On Tools Inc., Kenosha, Wis., has been elected president. He succeeds the late E. William Myers.

♦

William L. Ditges, formerly of Pittsburgh, has been made chief engineer, Morgan Engineering Co., Alliance, O., maker of cranes and other heavy plant machinery.

♦

Julius E. Graf has joined Treadwell Engineering Co., Easton, Pa., as vice president in charge of engineering. He formerly was assistant chief engineer, Carnegie-Illinois Steel Corp., and had been with subsidiaries of the United States Steel Corp. 28 years. Mr. Graf's headquarters for the present will be in the Farmers Bank building, Pittsburgh.

Malcolm W. Reed

Sydney Dillon

Julius E. Graf

Other officers of the Treadwell company are: Chairman of the board, J. S. Casey; president, G. R. Casey; vice president, W. C. Siegrist; secretary-treasurer, W. I. Gassert.

♦

Anthony J. Guthrie, secretary and assistant to the vice president in charge of plant operations, Chicago Pneumatic Tool Co., New York, has been appointed director of industrial relations.

♦

Lem Adams, formerly chief engineer, Oxweld Railroad Service Co., a unit of Union Carbide & Carbon Corp., New York, has been named vice president of the company, with headquarters at Chicago.

♦

John A. Schultz has been elected president, Jersey Shore Steel Co. Inc., Jersey Shore, Pa. John W. Spotts has been made secretary-treasurer, and S. C. Rebman, vice president and general manager.

♦

Ross A. Harbaugh, who has covered the Pittsburgh territory the past three years for Ross-Tacony Crucible Co., Philadelphia, has been placed in charge of the company's newly established Pittsburgh office in the Empire building.

♦

M. C. Baker has been elected vice president, and W. M. Hawkins, secretary, Parker-Wolverine Co., Detroit. W. L. Stadler and John D. Seofield, both of Detroit, have been elected directors, replacing M. M. Wise and S. C. Hale.

♦

W. O. Jones, formerly Pittsburgh district manager, Electric Auto-Lite Co., Toledo, O., has been appointed manager of the Pittsburgh service station of Bendix-Westinghouse Automotive Air Brake Co., succeeding R. E. Bohlen, resigned.

♦

W. E. Gardner has been appointed manager of Crucible Steel Co. of America's Boston branch, 135 Binney street, Cambridge, Mass. He succeeds W. P. Knecht, who has been appointed manager of the London, England, office, 9-21 Shand street, Tooley street, S. E. 1.

♦

Charles L. Jacobson, formerly sales manager, Chrysler division, Chrysler Corp., Detroit, is now vice president and general manager of that division. He succeeds Joseph W. Frazer, who recently resigned to become president and general manager, Willys-Overland Co.

♦

W. J. Ramsey, associated with Mathews Conveyer Co., Ellwood City, Pa., since 1929, has been appointed field engineer in the sales department, with headquarters in Philadelphia. He formerly was man-

ager of advertising and sales promotion. Henry E. Helling Jr., heretofore assistant advertising manager, succeeds Mr. Ramsey.

♦

John T. Harding, formerly an economist for several government departments and an investigator into trade relationships in Europe and the Near East, has joined the economic research division, National Industrial Conference board, New York, to handle problems on foreign relations.

♦

Howard Simpson, many years active in engineering development work with Ford Motor Co., Dear-

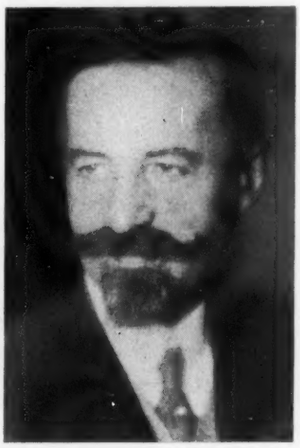
Leonard Larson

Who has been named chief engineer, Cleveland district, Republic Steel Corp., as noted in STEEL, Feb. 27, page 23

born, Mich., is now affiliated with Detroit Harvester Co., Detroit, and will supervise engineering and development work on a new line of agricultural implements, including power takeoff devices. (See Mirrors of Motordom, Feb. 27, p. 27).

♦

Albert Portevin, distinguished French metallurgist, has been made



Albert Portevin

R. H. Bahney

Newly appointed chief engineer, Central Alloy district, Republic Steel Corp., as reported in STEEL, Feb. 27, page 23

an honorary member, American Institute of Mining and Metallurgical Engineers. A graduate of Ecole Centrale des Arts et Manufactures, he is now a professor there and also at Ecole Superieure de Fonderie, and Ecole Superieure de Soudre Autogene. Prof. Portevin has done a large amount of work on steels and heat treatment, alloys, pig iron, and foundry practice. He recently was elected honorary president, Association Technique Fonderie de France.

♦

K. M. Hunt, assistant district sales manager at Chicago for Weirton Steel Co., Weirton, W. Va., has been promoted to district sales manager there. He succeeds H. L. Gray, recently made assistant vice president in charge of western sales. Frank W. Baron, resident manager of sales in Indianapolis, has been appointed district sales manager of that office, which heretofore has operated as a branch of the Chicago office.

DIED:

■ WILLIAM GRISWOLD HURLBERT, 80, founder and chairman of the board, Bostwick Steel Lath Co., Niles, O., Feb. 27. Born in Forrestville, N. Y., he went to the Mahoning Valley in 1889, and in June of that year the Bostwick Steel Lath Co. was organized. He was secretary-treasurer until 1902 when he was elected president and treasurer, continuing as president until last year. He was a member, American Iron and Steel institute.

♦

Ebenezer Francis, 80, former Cleveland district sales representative for Erie Forge Co., Erie, Pa., Feb. 22, in Cleveland. He was superintendent for Otis Steel Co. for a number of years before becoming associated with the Erie company.

♦

E. William Myers, 48, president, Snap-On Tools Inc., Kenosha, Wis., Feb. 16.

♦

Clifford C. Beatie, president, Beatie Steel & Supply Co., Oakland, Calif., in that city, Feb. 19.

♦

Arthur R. Schiele, 52, president, National Formetal Co., Cleveland, in that city, Feb. 22.

♦

Walter Bruce Grant, 79, president, American Tube Works, Somerville, Mass., Feb. 15.

♦

John L. Fleming, 76, European representative, United States Steel Products Co., New York, Feb. 15 in Brussels, Belgium.

♦

William Wallace Ford, 66, a vice president, West Penn Steel Co. prior to its merger with Allegheny Steel Co., in Pittsburgh, recently. He also was a director, Eclipse Pattern Co.

♦

James Shand, 79, for several years vice president and general manager, Joseph N. Smith Co., Detroit, one of the early makers of automobile parts, in that city, Feb. 8.

♦

James R. Murray, 51, former vice president and general manager, Murray Body Corp., Detroit, now the Murray Corp. of America, and head of Murray Steel Products Co., Hollydale, Calif., in Detroit, March 1.

♦

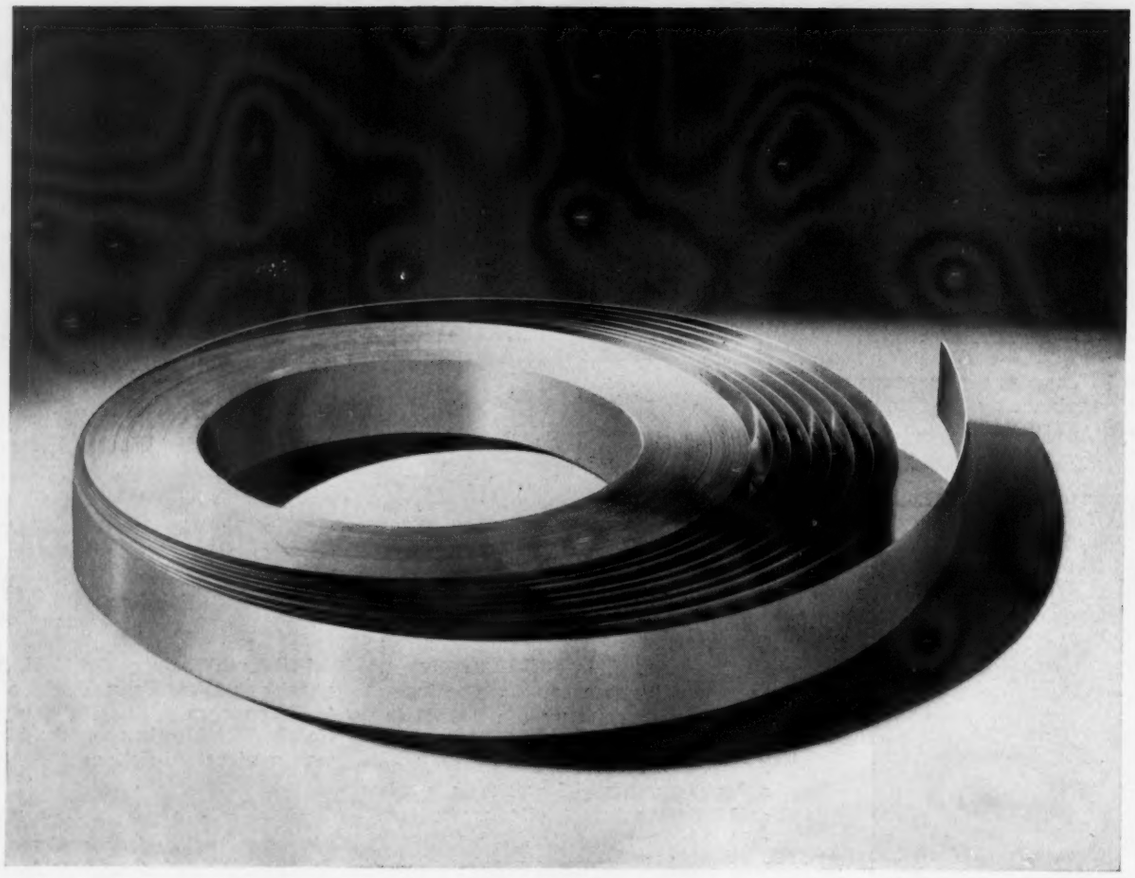
James L. Dailey, 47, in Des Moines, Iowa, Feb. 25. Mr. Dailey was contracting manager for Pittsburgh-Des Moines Steel Co., Pittsburgh, in Missouri and Kansas.

♦

Homer M. Wright, 47, metallurgist, with Michigan Malleable Iron Co., Detroit, for 23 years, in that city, Feb. 20. Mr. Wright pioneered in the development of pearlitic iron, and at the time of his death was head of the technical committee, Malleable Founders society.

♦

John Lee Buchanan, 55, co-ordinator of General Electric Co.'s enterprises at the 1939 New York World's fair, in Greenwich, Conn., Feb. 23. He joined General Electric in 1904, serving in various capacities until his appointment as chairman of the board, General Electric Supply Corp. in 1935, succeeding Gerard Swope. He was also assistant to the vice president, General Electric Co., and a director, Monowatt Corp.



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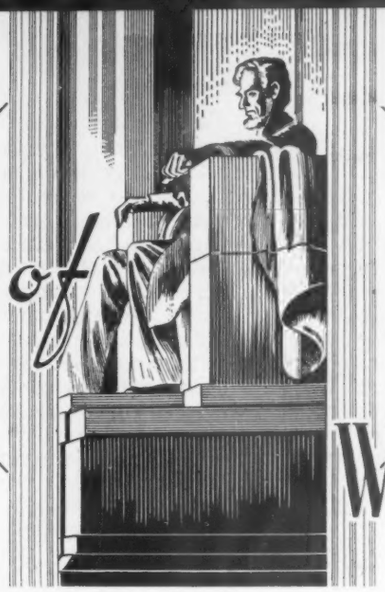


By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ HAS the administration had a change of heart toward business? Or are recent pronouncements by administration leaders simply more political maneuvers?

President Roosevelt, Secretary of Treasury Morgenthau and Secretary of Commerce Hopkins all have expressed their belief business taxes should be amended and that no new taxes on industry should be enacted.

Mr. Morgenthau last week assured business no new "burdensome" taxes are contemplated. At a press conference, Mr. Morgenthau said he hopes the present congress will eliminate all levies that might deter industry's progress and that would deny reasonable profits. He said there is no expectation that the administration will ask for increased revenues from new taxes.

Heartening to Some

Apropos to the administration's rapprochement toward industry, many industrial leaders have taken heart at the recent speech made by Hopkins, in urging closer co-operation between government and business.

Hopkins' speech would have been considered very important if it had not come after so many similar statements—which were not followed by the kind of action that encourages business.

However, some executives believe the situation is different now and Hopkins sincerely expressed the administration's desire to turn right.

Hopkins stressed the widespread lack of confidence among business men. "I am prepared to accept that premise, nor would I under-rate its importance," he said. "Lack of business confidence is and has been a hard stubborn fact and may be as real a deterrent to restored health as any we have to deal with. For that reason, if for no other reason, I do not propose to ignore it."

Discussing the tax situation, he stated: "While I feel there should be no general rise in federal taxes this year, I believe any federal taxes which tend to freeze the necessary flow of capital should be amended. If necessary, such taxes can be replaced by increasing other taxes which do not have the same deterring effect."

Of public utilities, Hopkins said: "One of the substantial avenues for private capital in the near future can be the field of public utilities. That being the case, it is extremely important there be a meeting of minds between the utilities and the government relative to the appropriate spheres of action of government on the one hand, and privately-owned and operated utilities on the other."

Representative Doughton, chairman, house ways and means committee, and Senator Harrison, chairman, senate finance committee, sent a joint letter to the secretary of treasury pledging their co-operation toward helping business through removal of any provisions of tax measures which act as deterrents to business.

They said their committees were in hearty sympathy with views expressed by the President concerning co-operation between business and government, and particularly with recent statements by the secretaries of treasury and commerce.

EARLY ADJOURNMENT WINS FAVOR IN CONGRESS

Speeding up the legislative machine to enable as early an adjournment as possible appears to be the desire of both Democrats and Republicans.

With the foreign situation uncertain, it is impossible to foretell the legislative progress, but the President recently stated no new legislative proposals will be submitted at this session by the administration. The Democratic leadership on both sides of the Capitol is making every effort to hurry action on the regular appropriation bills and such other legislation before congress.

Congressional leaders are expressing considerable doubt as to whether there will be any change in the national labor relations act at the present session and there is no indication that there will be any antitrust legislation.

Among matters pending in congress which will provoke discussion, if not action, are relief, the railroad legislation, social security revision, possible expansion of federal housing activities, and the extension of the life of many New Deal emergency agencies.

In connection with the antitrust situation, the assistant attorney general, Thurman Arnold, has laid a program before the house committee on the judiciary recommending changes in the antitrust laws which are designed to pave the way for business compliance and to lessen criminal prosecutions.

Approval of Plan Unlikely

The assistant attorney general presented to the committee a proposal for the creation of a government commission to advise businessmen how they can comply with the law and advise the department of justice on the legality and reasonableness of the plan. This resembles the original intention for the federal trade commission when it was organized during the Wilson administration.

While it is practically certain no action will be taken on the Arnold plan, it is interesting. Under his suggestions the government would proceed to indict business groups for violation of the antitrust law. These groups could then consult the government commission which he proposes on methods of reorganizing business to comply with the law. The commission would then advise the department of justice to accept or refuse the plan. Under the Arnold suggestion the justice department would seek an equity consent decree in the federal court

embodying the new plan of operation and the criminal prosecution would be dropped.

COURT DENOUNCES SIT-DOWN; LABOR BOARD REBUKED

National labor relations board last week received a setback by the Supreme Court in three decisions. Most important was the Fansteel Metallurgical Corp. case in which the tribunal denounced the sit-down strike as a "high-handed proceeding without shadow of legal right."

This is the first time the Supreme Court has ruled on sit-down strikes. It was ruled by the court that the participants in the strike and the following disorder had forfeited their protection by the national labor relations act and in so holding the court took direct issue with the labor relations board. The labor board had ordered Fansteel to reinstate and compensate the strikers.

The Supreme Court refused to review the contempt of court convictions of 39 Fansteel workmen. They were charged with violating a state court injunction restraining them from continuing the sit-down strike and were given varying sentences.

"Cause for Discharge"

In condemning the sit-down, the Supreme Court said: "This conduct on the part of the employes manifestly gave good cause for their discharge unless the national labor relations act abrogates the right of the employer to refuse to retain in his employ those who illegally take and hold possession of his property.

"We think that the argument misconstrued the statute," the court continued. "We are unable to conclude that congress intended to compel employers to retain persons in their employ regardless of their unlawful conduct—to invest those who go on strike with an immunity from discharge for acts of trespass or violence against the employer's property which they would not have enjoyed had they remained at work. Apart from the question of the constitutional validity of an enactment of that sort, it is enough to say that such a legislative intention should be found in some definite and unmistakable expression. We find no such expression."

The labor board received the other two reverses in the Supreme Court when lower court decisions were upheld, voiding the rulings of the labor board. One case involved the Columbian Enameling and Stamping Co., Terre Haute, Ill., and the other the Sands Mfg. Co., Cleveland. In the Columbian case the court upheld the contention of the seventh circuit court of appeals that the employes had struck before the enactment of the national labor relations act in violation of a contract not to strike and that therefore they were not entitled to protection of their status.

In the Sands case the labor board had held the company had refused to bargain collectively with its employes, had discriminated in regard to hire and tenure of employment and had discouraged membership in a labor organization, and had interfered in the rights of employes to organize. In this case also the seventh circuit court of appeals had rejected the labor board's claim and the Supreme Court upheld the lower court's decision.

UNION PEACE PART OF "BUSINESS APPEASEMENT"

Rival CIO and AFL leaders are far from optimistic that a lasting labor peace will result from the negotiations engineered by President Roosevelt as an element in his current business-appeasement maneuvers. Both William Green and John L. Lewis, however, named committees of three to discuss matters.

Secretary of Labor Perkins said Friday the first meeting probably will be held Tuesday, and that both she and the President will attend.

Lewis' note to the President merely announced his acceptance and the committee's personnel—himself, Philip Murray and Sidney Hillman. In a more lengthy letter, Green eliminated from the prospective negotiations the AFL structure, and policies on political and economic matters.

It is understood AFL leadership will continue to press for revision in the Wagner act and the labor board, regardless of the outcome. It also stands by the policy outlined in a recent manifesto: "Private industry and business generally should be stimulated, so that facilities of production may be increased and millions more working men and women may be re-employed."

CONGRESS EXTENDS LIFE OF IMPORT-EXPORT BANK

Congress has extended the life of the Export-Import bank for two years, to June 30, 1941. The bill limits the lending power of the bank to $100,000,000. The present limit is $125,000,000. The President is expected to sign the bill.

Senator Wagner, New York, handled the bill on the floor of the upper house, and he said that the continuance of the bank is necessary to combat foreign economic penetration in South America.

WPA IRON, STEEL ORDERS $164,152,836 IN 3½ YEARS

More than $900,000,000 worth of orders were placed in private industrial channels by the purchase of building materials, equipment and supplies for WPA projects in the three and one-half years ended Dec. 31, 1938, according to the WPA. Nearly one-fifth went for the purchase of iron and steel products, such as pipe and structural steel.

Figures which WPA made public indicated iron and steel products going into these projects totaled $164,152,836 of which $66,673,891 was from federal funds and $97,478,945 was from sponsors' funds.

Cast iron pipe and fittings totaled $49,396,889, of which $17,986,454 was from federal funds and $31,410,435 was from sponsors' funds. Heating and ventilating equipment totaled $8,367,653, of which $3,025,095 was from federal funds and $5,342,558 was from sponsors' funds. Structural and reinforcing steel totaled $41,453,881, of which $20,659,517 was from federal funds and $20,794,364 was from sponsors' funds. Tools, excluding machine tools, totaled $16,048,568, of which $7,642,334 was from federal funds and $8,406,234 was sponsors' funds, and other iron and steel products, totaled $48,885,845, of which $17,360,491 was from federal funds and $31,525,354 was from sponsors' funds.

WALSH-HEALEY IRON, STEEL PURCHASES TOTAL $360,164

For the week ended Feb. 25, the government purchased $360,165.53 worth of iron, steel and their products under the Walsh-Healey act; Erie Forge Co., Erie, Pa., $46,000; Messinger Bearings Inc., Philadelphia, $45,144; Corbin Cabinet Lock Co., The American Hdwe. Corp. Succ., New Britain, Conn., $13,726.20; National Lead Co., Atlantic branch, New York, $44,818.40; Mr. Ramon A. Pla, San Juan, P. R., $13,244.75; Alan Wood Steel Co., Conshohocken, Pa., $47,306.80; Central Iron & Steel Co., Harrisburg, Pa., $20,224; Raymond Concrete Pile Co., New York, $17,010; Inland Steel Co., Chicago, $12,755.56; and Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., $99,935.82.

SENATE GROUP APPROVES NATIONAL DEFENSE BILL

Senate military affairs committee last week favorably reported the national defense bill, passed by the house several weeks ago. One section of the measure provides for $34,500,000 for educational orders to familiarize industry with war *materiel* production.

Last year congress enacted an educational orders bill, providing $2,000,000 a year for five years. The war department is expected to place the first orders soon.

The senate military affairs committee reported the war department has indicated that 250 prime contracts valued at approximately $1,400,000,000 would be required to produce the critical items, should war come.

Activities of Steel Users, Makers

■ CLEVELAND Tractor Co., Cleveland, last week announced its entry into the wheel tractor field. Heretofore it has manufactured only crawler-type machines. Three new small agricultural tractors were presented at a meeting of distributors and salesmen. One is a wheel tractor of the tricycle-type, the other two, crawler models. Known as the "General", the wheel model is a 2200-pound, high-clearance tractor, made to sell fully equipped at about $600, f.o.b. Cleveland. It is expected this model will be produced on a schedule of 75 a day beginning March 6.

♦

Goodyear Tire & Rubber Co. has started a $3,000,000 modernization program at its Akron, O., plants. Of this amount, $1,800,000 already has been approved by directors and Goodyear engineers are now working out plans for the balance. Program provides for further mechanization, conveyor installations.

♦

Equipment for a complete hot and cold wide strip mill was shipped recently from Mesta Machine Co.'s plant at West Homestead, Pa., to eastern seaport. An entire ocean freighter will be required to transport the shipment to Shotton, Chester, England, where it will be erected for John Summers & Sons Ltd., steel producers.

♦

Motors Metal Mfg. Co., Detroit, has taken over the manufacture of a line of electric-steam radiators of pressed steel for the Electric Steam Radiator Corp., Detroit. (See Mirrors of Motordom, Feb. 20, p. 30).

♦

United Steel & Wire Co., Battle Creek, Mich., is observing the thirtieth anniversary of its founding in 1909 as Battle Creek Oven Rack Co.

♦

Edward G. Budd Mfg. Co., Philadelphia, has appointed Hal P. Curtis, Los Angeles, western representative.

♦

Buffalo Pumps Inc., Buffalo, has been awarded a $350,400 contract by the government for pumps to be installed in navy ships.

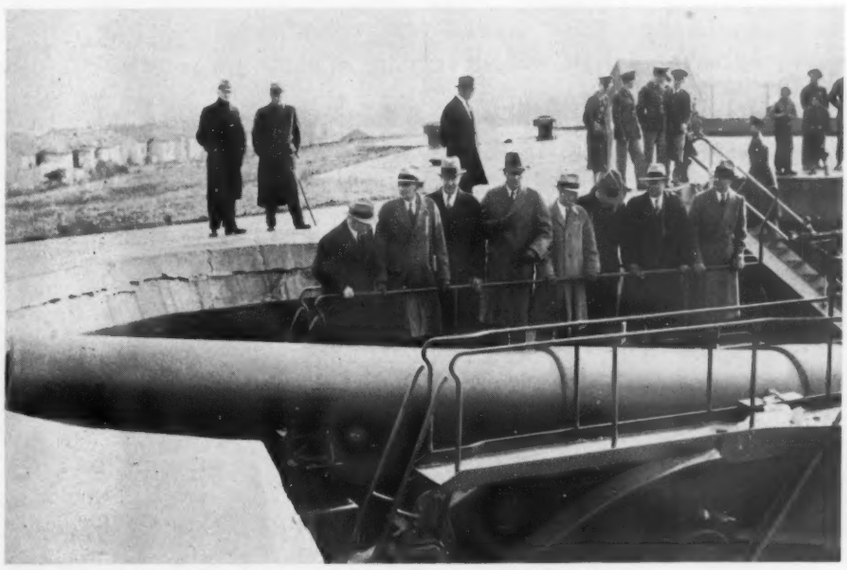
♦

National Radiator Corp., Johnstown, Pa., has appointed the following sales agencies to handle its line of industrial products: Eastern Steam Specialty Co. Inc., 125 Barclay street, New York, and Faville-LeVally Corp., 140 South Dearborn street, Chicago.

♦

Edge Moor Iron Works Inc., New York, has appointed Cochrane Engineering Co., Chicago, exclusive sales representative in the district comprising southern Illinois, northern Indiana, Wisconsin, and eastern Iowa, for the sale of fabricated vessels and chemical equipment.

Congressmen View Arms Demonstration



■ **Twenty-six members of the senate and house military affairs and military appropriations committees last week visited Fort Story and Langley Field, Virginia, in search of first-hand information relative to the army's military equipment program. The photo shows a group of congressmen as they inspected a gun at Fort Story. NEA photo**

Rise of Challenge To Enterprise

■ SURVIVAL of the enterprise principle, with the economic organization and political institutions based upon it, now are faced with a decisive challenge in the United States, writes Virgil Jordan, president, National Industrial Conference board, in the organization's annual report.

Prefacing a description of the board's structure, program, and services, he traces the development of a new situation in which the challenge to enterprise arises. Management's accomplishments and services, he says, have been ignored or taken for granted while the people were looking for leadership in a period of unprecedented disorder, doubt, confusion and conflict. Politicians were quick to promise means to expand power over the social resources created by enterprise.

"To meet the challenge of this situation a fresh approach, new attitudes, new agencies, new methods, heightened morale, greater energy, unity and courage have been needed throughout the enterprise organization and its leadership.

"Management has had to become not merely active politically, but conscious, competent and coherent in national affairs affecting the economic progress and social welfare of the American people. Statesmanship has necessarily become part of its professional responsibility."

Salesmen Expect Increase In Machine Tool Orders

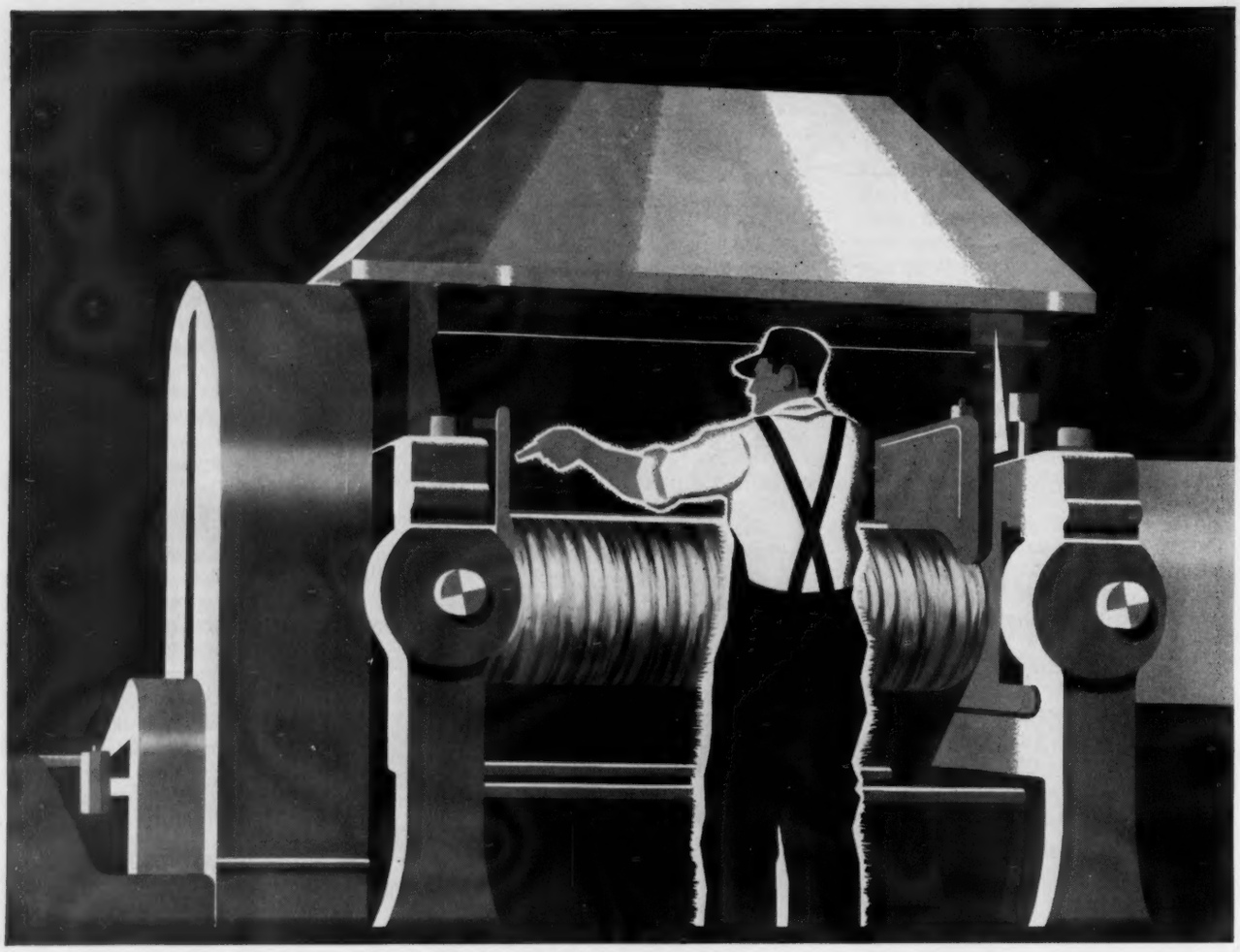
■ Machine tool buying is definitely on the upturn, according to salesmen of Warner & Swasey Co., machine tool builders, Cleveland, who attended the company's annual sales conference recently. Twenty-two sales districts in the United States and Canada were represented.

Salesmen from practically all these districts said they anticipate an increase in orders, inquiries coming from almost every line of industrial activity.

Company 50 Years Old, Honors Veteran Employes

■ Heppenstall Co., Pittsburgh, celebrated its fiftieth anniversary recently with presentation of service awards to veteran workers.

C. W. Heppenstall, board chairman, who has served the company 46 years and whose father, Sam Heppenstall, founded the firm in 1889, was given a plaque carrying his likeness and names of the veterans.



CAST IRON AND CONFIDENCE

A Molybdenum addition to cast iron has often proved the best way to get the most out of money spent to improve materials.

The selection of a gray cast iron with 0.75% Moly for 64-inch rubber mill drives is a typical example. The Moly iron is strong (a test showed 61,000 p.s.i.) and tough enough to stand severe service. Despite the necessary hardness, machining presents no difficulties. Thus full advantage is taken of the economy of cast iron, without sacrifice of performance capacity.

This is only one of the many cases in which Molybdenum iron has brought about a combination of economy with dependability. Investigation may show that you can apply it with advantage. Our technical book, "Molybdenum in Cast Iron," is free to interested production executives and engineers on request.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

Climax Mo-lyb-den-um Company
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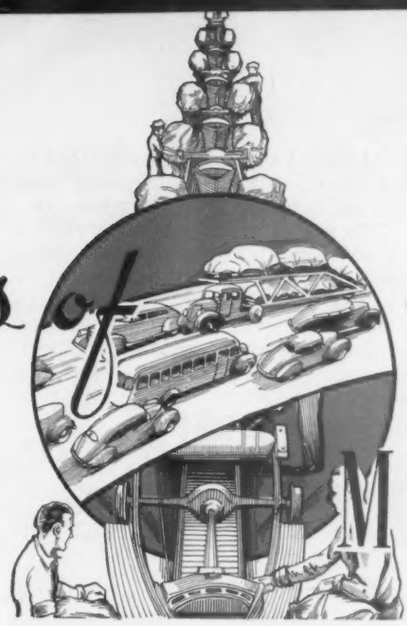
MOLY

Mirrors of MOTORDOM



By A. H. ALLEN
Detroit Editor, STEEL

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DETROIT

■ HOW is a new model automobile created? By what devious processes is a new design transferred from the minds of its creators to the assembly line? Just now a score or more of these brain children are going through the routine channels of birth, and a brief summary and glance behind the scenes in this activity may be timely.

First, visualize a large conference table and a corps of engineers and designers. The engineers are explaining some new ideas for mechanical details of 1940 models; the designers are attempting to assimilate these ideas and fit around them their own conceptions of the new model's appearance. Perhaps wheelbase will be lengthened, or springing changed, or frames reproportioned, or engines relocated.

Designers take these mechanical innovations and retire to their drawing boards to give vent to their creative abilities. Sketches by the hundreds are prepared, some of various parts, some of the overall model. On an average, 1500 separate sketches are prepared in the process of arriving at one finished design. To aid in this preliminary sketching, files of past years' drawings are reconsulted, searching study is made of trends in interior decorating, women's costumes, architecture, and results of surveys made among thousands of the motoring public.

Out of this deluge of designers' sketches, critical appraisal narrows the field of ideas down to a few which appear immediately practicable—the rest are filed away for the future.

From drawing boards, the new model now goes to sculptors who fashion it in clay, one-quarter size. Clay models have two main advantages over drawings: They may be changed easily, and they are, of course, in three dimensions. Further these small models permit study of characteristics other than appearance—wind tunnel tests, for example, often being made on them to determine wind resistance, wind noise, and the like.

Now the production experts and engineers step back into the picture to determine whether the tools and materials available in their plants can be adapted to handle problems presented by the new designs. In other words, a designer's creation may appear wonderful in quarter-size clay, but the production problems involved might tie a stamping plant or an assembly line into inconceivable kinks. Therefore, the production chiefs usually have a few alterations or refinements to suggest, and these are effected quickly in the clay models. Thereupon a full-size drawing of the design is made in chalk on a blackboard. Here every curve and every dimension is

■ **Sculptor (left) at work on front-end design in clay model. At right is full-size blackboard layout of new model, complete in every detail**

plotted accurately and drawn in outline, both end views and side views.

Then follows a protracted series of chalk talks among designers, engineers and operating personnel. Are the doors wide enough? Is vision clear and unobstructed? Are the seats placed properly to establish correct head and leg room? Where should instruments and controls be placed?

As a final check on the interior plan, a "trim buck" is constructed—a skeleton framework built in accordance with proposed interior measurements and arrangement.

With external outlines of the car established, tracings of the blackboard drawings are made on vellum paper and turned over to draftsmen. Here the work is divided between two groups. One prepares full-size working drawings of the contours of the car, using the vellum tracings. Another group concentrates on working drawings of details such as bumpers, emblems and headlights. As time goes on and the design progresses through the various stages of full-size clay model, wood model and finished body, draftsmen can revise and keep up-to-date the working drawings.

Make Full-Size Models

But this is getting a little ahead of the story. When the new design approaches its final stages, full-size models must be made in order to insure a complete harmony of design. Using the working drawings, a full-size clay model is built up carefully over a wood form. Every detail of the exterior surface is developed accurately, so that from the standpoint of size and appearance this clay model is an exact replica of a finished car. Various combinations of louvers, lights, fenders and grilles may be tried out on this model before a final selection is made. No door or window glass is installed at this stage, and the interior is rough and unfinished.

Finally, when all changes have been made and approved, templates and patterns are taken of every curve and contour for construction of a hand-made wood model. The latter is a masterpiece of the patternmaker's art. Using mahogany and poplar, as well as metal, a full-size model is built up and completed in every detail, inside and outside. Such parts as bumpers, grilles and body hardware are turned out by skilled workers and finished complete even to the last bit of chromium plate. The car is trimmed, seats are installed, glass put in windows, tires mounted in position. Exterior surfaces are covered with cloth and painted to obtain an extra smooth surface simulating the gloss of the final product. Lacking engine, frame and all the other chassis accouterments, this final model so closely resembles the real thing that the difference cannot be discerned at six feet.

The model usually is then shown to key executives to obtain a final unanimity of approval before a complete set of master drawings is made and turned over to engineers. Shop drawings then are made and shortly specifications are released for dies and patterns and the new program is in full swing.

Naturally all these involved steps are not accomplished in a month or even in a year. Often two years pass between the time designers make their original sketches and the time the new model rolls from assembly lines. With some minor variations, this is the procedure followed by the major automobile producers. A detailed discussion of new model development and related phases of designing and styling is presented in a booklet, *Modes and Motors*, recently published by the public relations department of General Motors Corp., Detroit.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1937	1938	1939
Jan.	399,186	227,130	353,946
Feb.	383,900	202,589	*315,000
March	519,022	238,598	.....
April	553,231	238,133	.....
May	540,377	210,183	.....
June	521,153	189,399	.....
July	456,909	150,444	.....
Aug.	405,072	96,936	.....
Sept.	175,630	89,623	.....
Oct.	337,979	215,296	.....
Nov.	376,629	390,350	.....
Dec.	347,349	407,016	.....
Year	5,016,437	2,655,777	.....

*Estimated.

Estimated by *Ward's Reports*

Week ended:	1939	1938†
Feb. 4	79,410	51,443
Feb. 11	84,500	57,810
Feb. 18	79,860	59,100
Feb. 25	‡75,660	56,977
March 4	78,705	54,440

†Comparable week.

	Week Ended Mar. 4	Week Ended Feb. 25
General Motors	35,255	34,765
Chrysler	19,835	‡17,060
Ford	15,400	16,600
All others	8,215	7,235

‡Revised.

■ IN LINE with earlier anticipations, assemblies already are returning to a full-week basis. Buick has extended operations for March to five days a week and has scheduled 26,650 units, including production for export. This compares with 19,650 units built in February and with 20,000 assembled in January.

In connection with the two new models which Buick is planning to add to its present line, as mentioned here last week, it is reliably stated the smaller of these, below the present 40 model in size, tentatively has been christened the Torpedo.

Studebaker's new light six, the Champion, will be unveiled to the public shortly after the first of April, according to present plans.

In recent weeks a serious hitch appears to have developed in Packard's plans for a new light six. Despite the fact releases had been made on a considerable volume of tool and die work, some orders placed for certain parts, and extensive changes started in plant and production equipment, as late as last Thursday the program was understood to be held up either for revisions or permanently. Patterns have been recalled from certain foundries, tool and die work suspended, and an order for presses amounting to about $200,000 has been cancelled. Explanation appearing most likely to the trade is that conflicting opinions on certain aspects of the new model have caused the project to be halted for the time being.

New Bulb in the Making

Ford's new plant in Paris now is in process of being equipped to supply daily output of 100 cars a day. Some months ago mention was made in this department of the proposal to abandon operations in the company's Strasbourg plant and transfer this activity to a new location in Paris. This has been done and a large share of the equipment needs of the new plant have been taken care of by machinery in the abandoned plant, supplemented by certain machinery to be shipped from the Rouge plant here.

It is understood no pressed steel parts of cars produced in Paris will be made by the plant there, an outside independent source instead furnishing body stampings.

Experimental work on a new type of automobile headlamp bulb is being pushed vigorously by the General Electric Co. and certain units of the automotive industry, but as yet the details are being guarded closely, not to be released officially before automobile show time. Essentially the bulb is patterned after the new GE photoflood bulb with built-in reflector. It is of fairly large diameter, about 5 or 6 inches, and the reflecting surface, usually of aluminum, is deposited on the inside of the bulb, obviating the need for a separate reflector in the headlamp assembly. A committee representing the automobile industry is studying the possibilities of the bulb, but will release no information until some manufacturer definitely has adopted the device. Private opinion is that several producers already have committed themselves to use of the bulb, and there will be a fairly universal switch to it in the next few years.

Please note this "quiz" —and pass along

Mr. _____ ☐
METALLURGIST

Mr. _____ ☐
DESIGN ENGINEER

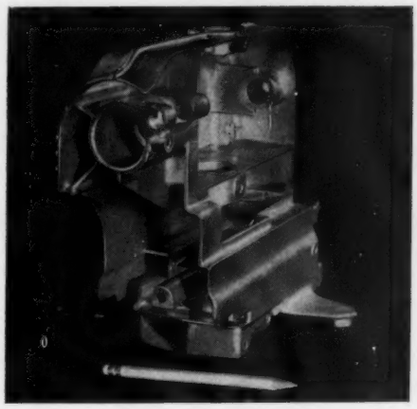
Mr. _____ ☐
PRODUCTION MANAGER

Mr. _____ ☐
FINISHING SUPERINTENDENT

Mr. _____ ☐
SALES MANAGER

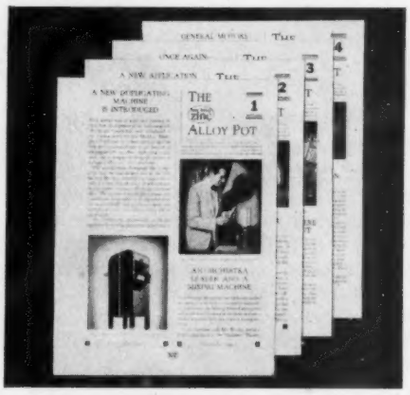
Mr. Metallurgist ☑

Q How do you rate ZINC Alloy with other metals in actual casting characteristics?



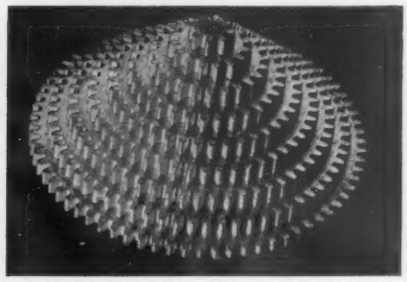
A The ZINC Die Casting Alloys lead the field in combining castability with strength and hardness. They permit the die caster to use the simplest and most rapid machines—and to produce the most intricate shapes possible with any known single-step fabricating method. An interesting example is the washing machine gear case shown here. (Note the pencil for size.)

Mr. Design Engineer ☑

Q How do you keep abreast of developments in ZINC Alloy Die Casting?

A Although the metal trade journals carry a wealth of information on die casting developments, The New Jersey Zinc Company produces—at regular intervals—the *only* publication devoted exclusively to news and information about ZINC Alloy Die Castings. A request on your company letterhead will place your name on "The Alloy Pot" mailing list.

Mr. Production Manager ☑

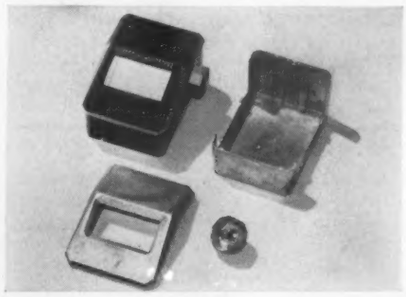
Q Why do you refer to die casting as "the one piece production process"?



A This cone gear for a computing mechanism could not have been produced economically in one piece by any method other than die casting. The alternative is an assembly of 9 separate gears—with 9 machining operations.

Mr. Finishing Supt. ☑

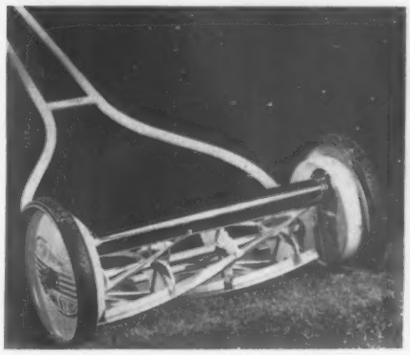
Q Do you suggest the use of a chemical pretreatment on ZINC Alloy Die Castings which are to be given an organic finish?



A Proprietary treatments, which produce an adherent film of zinc phosphate on the surface of the casting, are remarkably effective in improving the adherence retention of organic coatings. A number of these chemical pretreatments are now available.

Mr. Sales Manager ☑

Q How can the use of ZINC Alloy Die Castings in your products help you in your sales job?



A ZINC Alloy Die Castings not only provide extreme accuracy, strength, economy and other sales advantages, but you can point to their extensive use in thousands of practical every day products—backed by well known, progressive manufacturers. (An impressive list of names and uses on request.)

We have tried, in this advertisement, to approach the subject of ZINC Alloy Die Castings from several different angles. But if your job is to design, produce or sell metal parts, you should have a well rounded picture of all of the advantages this modern metal and method has to offer. Consult any commercial die caster —or write to The New Jersey Zinc Company, 160 Front Street, New York.

ZINC ALLOY DIE CASTINGS

The Research was done, the Alloys were developed, and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99+% Uniform Quality) ZINC

Show Steel in School Rooms

■ AMERICA'S 27,000,000 public school children sit in steel-frame chairs at steel-frame desks, store their hats, coats and books in all-steel lockers. In the laboratories they work at steel tables; in the school shop, they gain practical training in both wood and metal-working with small machine tools, lathes, planers, boring machines, saws, etc.

This was demonstrated last week at an exhibit incidental to the American Association of School Administrators' convention in Cleveland. More than a score of school furniture and equipment items made entirely or largely of steel were displayed.

Seats and desks featured pressed steel frames with wood and plywood surfaces. Filing cabinets, lockers and some office chairs and desks were all-steel.

Cafeteria and laboratory equipment makes considerable use of steel, although exhibitors showed fewer stainless steel applications than might have been expected considering the widespread adoption of this metal in commercial laboratories and restaurants.

Power-driven wood and metal-working machinery now is standard equipment for most school shops.

All-metal test scoring machines, card sorters, calculators, typewriters, duplicators, and special business machines find an important market in educational institutions.

Air conditioning is gaining a foothold through individual room installations. Motion picture projectors are meeting increasing favor through trend toward visual education.

MEETINGS

ENGINEERS OF WISCONSIN PLAN ANNUAL MEETING

■ ENGINEERING SOCIETY of Wisconsin will hold its annual convention at Hotel Pfister, Milwaukee, March 15-17. A feature will be a luncheon March 16 at the clubhouse of Allis-Chalmers Mfg. Co. in West Allis, followed by an inspection of the company's works. Other visits to industrial and power plants are planned for the three days.

CASTABILITY IS TOPIC FOR LANSING FOUNDRY MEETING

Sixth annual sectional foundry conference of the Detroit chapter of the American Foundrymen's association and Michigan State college at East Lansing, Mich., April 14-15, will devote its three technical sessions to the subject of castability. Speakers will deal with external influences and internal reactions.

Among those who will contribute to the discussions are: F. J. Walls, International Nickel Co. Inc., New York; F. A. Melmoth, Detroit Steel Casting Co., Detroit; J. L. Stoddard, Detroit Testing Laboratory, Detroit; H. L. Womochel and C. C. Sigerfoos, Michigan State college; W. E. Sicka, Aluminum Co. of America, Cleveland; H. W. Dietert, H. W. Dietert Co., Detroit; V. A. Crosby, Climax Molybdenum Co. of Michigan, Detroit; W. H. Spencer, Sealed Power Corp., Muskegon, Mich.; John Lowe, Centrifugal Casting Co., Lansing, Mich.; E. K. Smith, Electro Metallurgical Co., Detroit; R. J. Wilcox, Michigan Steel Casting Co., Detroit; and R. G. McElwee, Vanadian Corp. of America, Detroit.

WAREHOUSE GROUP TO HOLD CONVENTION IN CHICAGO

American Steel Warehouse Association Inc. will conduct its thirtieth annual convention at the Drake hotel, Chicago, May 16-17. W. S. Doxsey, 442 Terminal Tower, Cleveland, is executive secretary.

CERAMIC SOCIETY TO CONVENE IN CHICAGO

American Ceramic society is perfecting plans for its forty-first annual meeting at the Stevens hotel, April 16-21. Convention plans include general sessions, technical sessions and entertainment. Group meetings will be sponsored by the enamel, material and equipment, and refractories divisions. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

CONFERENCE WILL REVIEW PHOTOELASTICITY WORK

Ninth semiannual Eastern Photoelasticity conference is to be conducted at Cornell university, Ithaca, N. Y., May 13. A program of technical papers will be supplemented by an exhibit of equipment for photoelastic research and demonstrations in university laboratories.

BETTER BUSINESS RELATIONS

A conference on "Better Business Relations" will be held March 8, Statler hotel, St. Louis, under auspices of the St. Louis chamber of commerce. The program features public relations, with speakers of national prominence in this field.

GAS SALES CONFERENCE

American Gas association's conference on industrial gas sales will be held at Hotel Statler, Cleveland, March 27-28. Sales and promotional problems will be discussed. Eugene D. Milener, New York, is secretary of the association.

British Test Portable Steel Air Raid Shelter

■ **Bell-shaped steel plate shelters are England's newest defense against air raids. In a Birmingham test, a heavy building wall section was pushed over on one of the structures, without harm to the person inside. Shelters are portable, offer refuge to one to four people, are designed to protect those who cannot leave their posts during air raids. NEA photo**

Preparing War Material "Musts"

■ MINING AND METALLURGICAL Society of America, New York, is sending to its members for approval a tentative list of 45 minerals, metals and chemicals which it considers advisable for this country to have in ample stock to meet a war emergency.

This is done with a view to assisting the government. When the list is finally approved by the society it will be sent to President Roosevelt, members of the cabinet, congress and the federal munitions board.

Alloying Elements Needed

The list includes tungsten, zirconium, and manganese, mercury, cobalt, mica, chromium, platinum, vanadium, uranium, tantalum, tin, antimony and graphite. Some items are in fair supply in this country, but the inference is that still heavier stocks should be accumulated. Materials listed as abundant include iron and steel, molybdenum, pyrites, copper, cadmium, asphalt, sulphur and sulphuric acid, chlorine and petroleum.

Members of the committee on essential minerals for national defense, who compiled the list, are W. R. Ingalls, chairman; D. N. Lidell, A. S. Dwight, R. C. Allen, Arthur Notman, Reno H. Sales, H. T. Hamilton, George A. Easley and Percy E. Barbour.

NONFERROUS INVENTORIES AVERAGE ONLY 39 DAYS

Survey by the George Birkenstein Corp., Chicago refiners, smelters and nonferrous metals dealers and consultants, indicates nonferrous metal inventories are sufficient only for 39 days on the average. Forty-four per cent of the companies replying to the questionnaire stated purchases would be necessary in 30 days or less; 32 per cent in 60 days or less; 15 per cent in 90 days or less; 9 per cent in over 90 days.

Half the companies reported business had increased 25 per cent since September, 1938; 19 per cent experienced a decline of 23 per cent; the balance reported no change.

Sixty-five per cent of the companies reported first quarter business gained 32 per cent compared with the final quarter of 1938; 20 per cent a decline of 22 per cent; and the balance unchanged business. Sixty-five per cent also expect second quarter volume to show an increase of 30 per cent over second quarter last year; 11 per cent a decline of 17 per cent; and the balance an unchanged volume.

Thirty-five per cent regarded present inventories 34 per cent above normal; 36 per cent approximately 25 per cent below normal; balance regarded inventories normal. Noteworthy fact was that metal consumers consider "normal" inventories smaller than heretofore.

DOMESTIC MANGANESE SEEN AS COMPETITOR OF FOREIGN

Freeport Sulphur Co. in its annual financial report last week revealed that its subsidiary, Cuban-American Manganese Corp., had been successful in reducing costs to the point that the company is now able to compete with foreign manganese producers "despite the fact world prices are at virtually dump levels".

"Availability of manganese from our supplies in Cuba is of strategic importance to the steel industry of America," Langbourne M. Williams, Jr., president, stated. "The company now has in storage approximately 75,000 tons of high-grade ore suitable for the manufacture of ferromanganese and, in addition, has 25,000 tons of low-grade manganese to care for the needs of customers for this product."

"The information about the Cuban operation contained in the report", it was said in a summary, " is of significance not only because of the American government's interest in the maintenance of a Cuban supply, but also because the company is now successfully concentrating ore of a grade similar to that of the deposits which are located in the United States."

YEAR'S TIN PRODUCTION DOWN 28.4 PER CENT

World tin production in 1938 was 148,100 gross tons, 28.4 per cent less than the record 1937 output, 206,900 tons, but above average output for 1929-1937, according to the International Tin Research and Development council, New York. World apparent consumption at 151,600 tons compared with 198,700 tons in 1937.

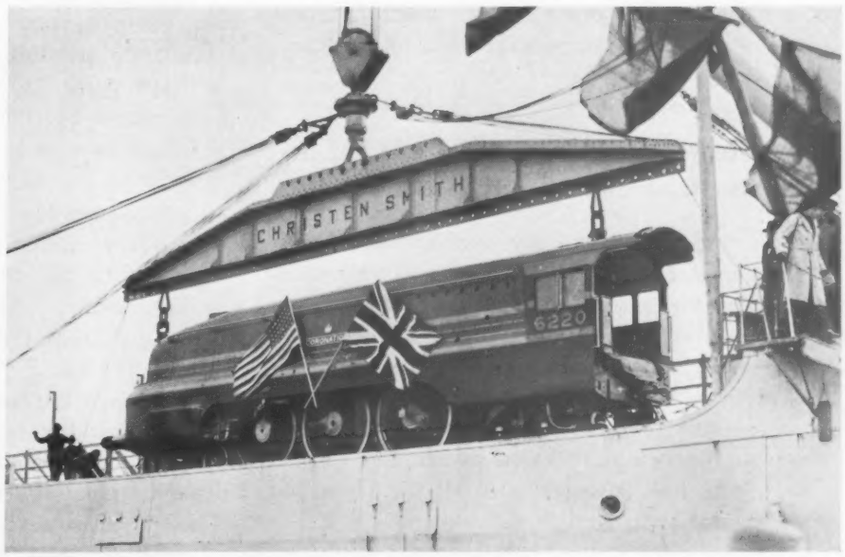
Consumption statistics for principal countries in 1937 and 1938, in gross tons:

	1937	1938	Per cent increase, decrease
United States....	86,633	50,723	—41
United Kingdom.	25,971	18,290	—30
U. S. S. R.....	25,125	16,174	—36
Germany, Austria	12,392	13,491	+ 9
Japan	8,190	11,000	+34
France	9,175	9,049	— 1
Italy	3,584	4,618	+29

World visible supply of tin increased 2958 gross tons in February, to 26,174 tons, a new high since 1933. Carryovers declined 1518 tons to 7547 tons at Straits and 435 tons at Arnheim to 1524 tons, a net increase of world visible plus carryovers of 1005 tons, a total of 35,245 tons.

World tin plate production in 1938 was 2,975,000 tons, a decrease of 31 per cent from 4,258,000 tons in 1937. Production in Spain increased from 8948 tons in 1937 to 35,369 tons in 1938.

Swinging the Coronation Scot to Our Shores



■ With the steel-beam unloader, locomotive, seven coaches and a sleeping car, comprising the latest in the line of famous British fliers, was unloaded at Locust Point, Baltimore. The train will tour the country, as did the Royal Scot several years ago, and then be exhibited at the New York world's fair. NEA photo

Editorial

Recent Utterances Stimulate Confidence

■ A NUMBER of utterances from high sources in recent weeks should have the effect of stimulating business confidence. The most heartening development is the Supreme Court's judgment, handed down last Monday, that four of the recent rulings of the national labor relations board are illegal.

The Supreme Court ruled, as reported elsewhere in this issue, that the sitdown strike is illegal. It held that the labor board has no authority to order employers to reinstate sitdowners. It declared that workers who violate non-strike agreements lose the protection of the labor act. It found that courts have the power to examine proceedings, records and evidence in cases conducted by the board in order to ascertain whether the board's orders are justified.

These decisions constitute a wholesome and encouraging reaffirmation of individual and property rights which, in the light of the labor board's administration of the labor act, had appeared to be threatened.

Business Wants More Details About The Changed Government Attitude

Industry also may derive considerable comfort from recent assurances by leading administration spokesmen, particularly that which refers to the reform program as practically completed and declares that the emphasis has shifted from reform to recovery, and that the present administration "is now determined to promote that recovery with all the vigor and power at its command."

So far this new determination to stimulate business has been expressed in no definite way. Businessmen will want a more concrete picture of the help that is to be given them before they feel justified in reshaping their policies.

Business hears with approval the recommendations that any federal taxes which "tend to freeze the flow of capital should be amended." But it feels that the assurance that taxes need not be increased may be unwarranted. The assurance is based on the assumption that an elevation in the national income to eighty billions would provide the additional needed revenue. Business fears that as long as government spends more than it takes in, higher taxes are inevitable.

Prosperity Will Come if It Is Sought With Intelligence

Business wants to see a definite trend toward lower expenditures by government. It wants assurances that the present national relief policy will be reformed. It wants the government to get out of competition with private industry, or at least indicate definitely the limits within which it proposes to compete in the future. It wants revision of a number of laws which have caused grave dislocations and serve as brakes to progress.

When leading administration spokesmen, however, declare that far more people should be placed on private payrolls, that businessmen have to make money to hire workers, that the budget can be balanced, that the tax system should be revised to encourage business, that labor's contribution should be tolerance and fairness, that the railroad problem must be solved, and that special efforts should be made to promote expansion in the utilities and in house construction, it is good news. If a sincere and practical approach is made on these objectives, greater prosperity must lie ahead.

The BUSINESS TREND

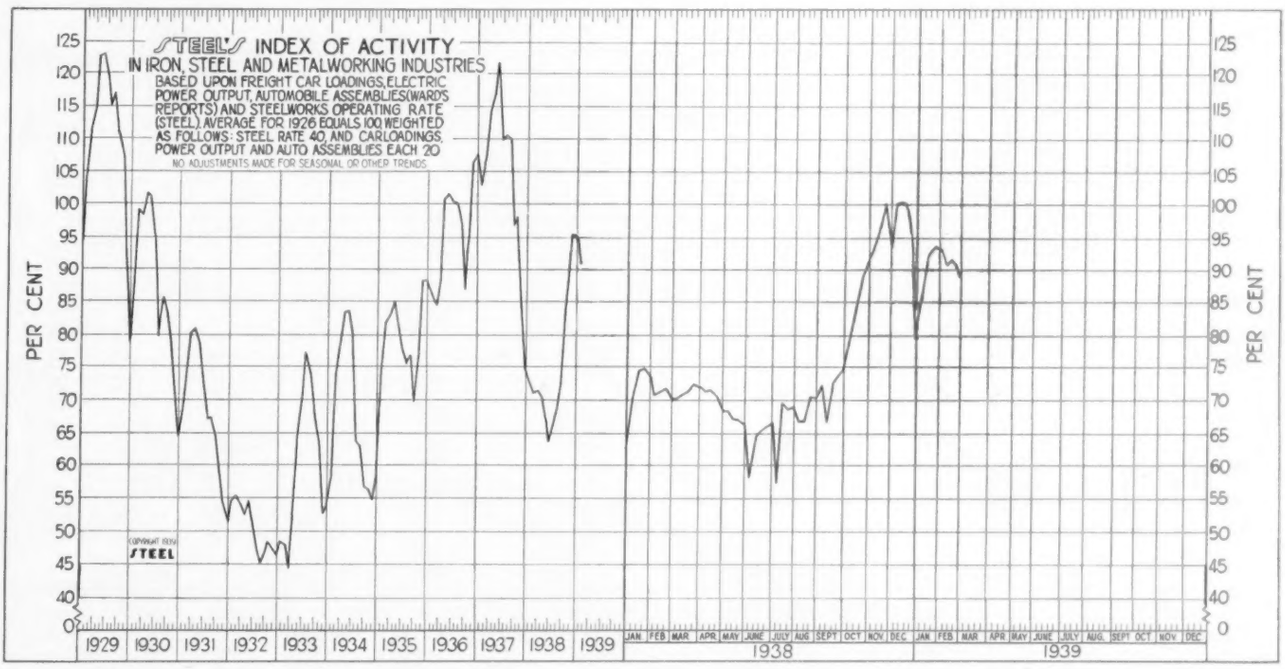
Seasonal Factors Depress Index of Activity

■ CONTINUED sluggishness in new demand is reflected in the downward seasonal tendency of most industrial indicators. This condition in the iron, steel and metalworking industries caused STEEL'S index to recede 1.8 points to 89.3 in the week ended Feb. 25. In the comparable week last month the index stood at 92.9.

Contributing to the present decline were moderate losses in three of the four industrial barometers from which the index is composed.

Steelmaking operations remained unchanged at 55 per cent in the week ended Feb. 25. The present level of steel ingot production is substantially above the 30.5 per cent rate in the comparable week last year, but remains well below the 1938 peak of 63 per cent recorded during the week ended Nov. 19. Probable developments during March point to a gradual seasonal rise in the national steel rate, with the anticipated improvement in demand from the construction and automotive industries standing out as the most bullish factors.

The factional labor dispute at the Plymouth plant was reflected in a more than seasonal decline in automobile assemblies for the week ended Feb. 25. Despite the drop in automobile production that week to 75,660 units, assemblies were 27 per cent above the comparative week last year. Domestic retail automobile sales in January totaled 217,796, according to the Automobile Manufac-


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL). AVERAGE FOR 1926 EQUALS 100 WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 0
1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1938
1939
STEEL

STEEL'S index of activity declined 1.8 points to 89.3 per cent in the week ended Feb. 25:

Week ending	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
Dec. 10	100.7	80.5	113.9	91.8	56.8	52.6	46.6	53.1	68.2	83.4
Dec. 17	99.8	79.4	114.8	91.9	60.6	56.0	49.3	52.3	67.3	79.7
Dec. 24	94.8	69.5	93.3	77.3	64.4	58.0	46.9	46.8	52.3	64.9
Dec. 31	79.9	62.7	96.6	78.2	60.8	53.7	42.9	48.8	58.5	74.3
	1939	**1938**	**1937**	**1936**	**1935**	**1934**	**1933**	**1932**	**1931**	**1930**	**1929**
Jan. 7	86.5	70.1	107.8	90.2	65.4	53.6	45.3	55.8	69.2	88.1	94.8
Jan. 14	91.9	74.4	106.7	89.3	73.8	58.1	48.6	56.2	72.1	91.8	104.2
Jan. 21	93.0	74.7	104.0	86.0	78.1	60.9	49.8	55.8	72.9	96.3	107.5
Jan. 28	92.9	73.8	99.6	86.5	79.5	62.3	50.8	56.2	72.9	97.4	109.8
Feb. 4	90.7	70.9	100.8	83.8	81.8	66.9	49.9	56.0	74.9	100.8	111.3
Feb. 11	92.1	71.2	101.9	85.9	82.7	70.7	48.7	55.5	75.4	100.9	111.7
Feb. 18	91.1	71.9	108.8	81.8	82.8	72.4	48.3	54.5	76.0	97.7	112.6
Feb. 25	89.3	70.3	112.8	83.4	80.5	75.5	46.0	55.1	75.8	99.7	109.2

turer's association. This represents a decline of 22 per cent from the December sales of 270,775, but exceeds the January, 1938, total of 158,727 units.

Revenue freight carloadings declined 19,462 cars to 560,609 in the week ended Feb. 25. This decline is slightly more than seasonal, but freight traffic exceeds the comparable week last year by a comfortable margin. Electric power consumption recorded the fourth consecutive weekly decline during the week ended Feb. 25. However this tendency is considered seasonal. Power output of 2,225,690,000 kilowatt-hours in that week compares with 2,248,767,000 kilowatt-hours in the week ended Feb. 18, but remains substantially above the corresponding week last year when output was placed at 2,031,412,000 kilowatt-hours.

FAILURES INCREASE SHARPLY

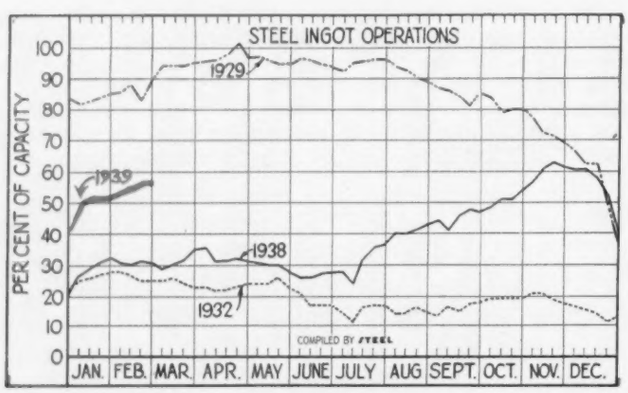
The number of commercial failures during January recorded a more than seasonal increase over the December level, reaching the highest total since January, 1938. The 1263 disasters in January with liabilities of $19,122,000 represented an increase of 44.3 per cent over the 875 failures in December with liabilities of $36,528,000. This constitutes the sharpest increase in failures during January over December since 1915, when the increase amounted to 46.9 per cent.

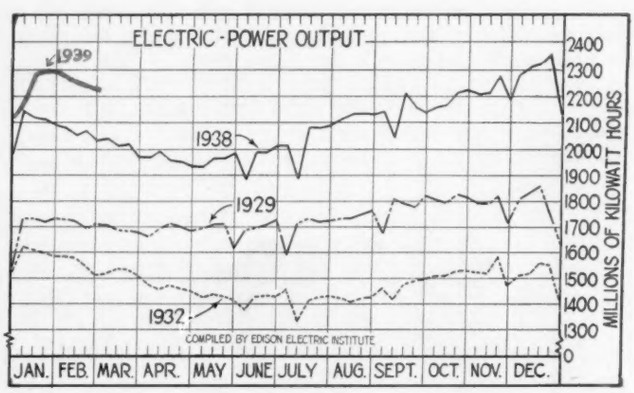
AUTOMOBILE OUTPUT OFF SEASONALLY

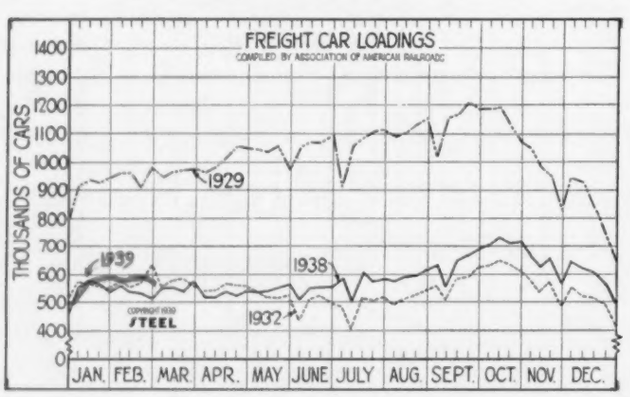
Production of automobiles including passenger cars and trucks in the United States and Canada, declined 53,070 units to 353,946 during January, but remained substantially above the 227,130 units assembled in the comparable month last year. The estimated total production during February of 315,000 indicates a seasonal decline in assemblies for that month, but still remains more than 50 per cent above the corresponding period last year. A gradual improvement in automobile production from the moderately lower levels experienced the past two months is indicated for March.

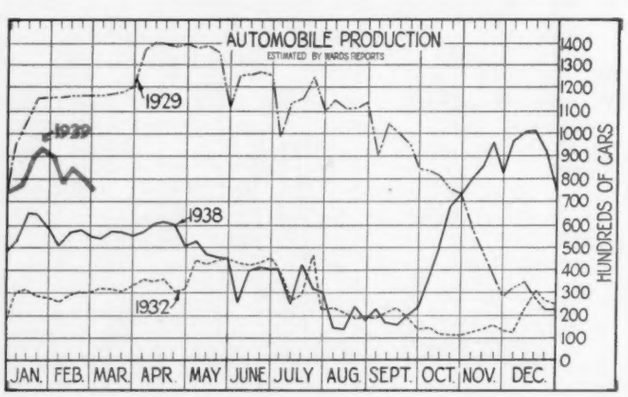
COMMODITY PRICES SLIGHTLY LOWER

The all commodity wholesale price index of the United States Department of Labor recorded the fourth consecutive monthly decline during January. The index eased one point to 76.9 per cent in January to reach the lowest point since December. 1934, when the index also stood at 76.9. In January of last year the index was placed at 80.9. Early estimate for February indicates a still further decline in commodity prices to slightly lower levels.



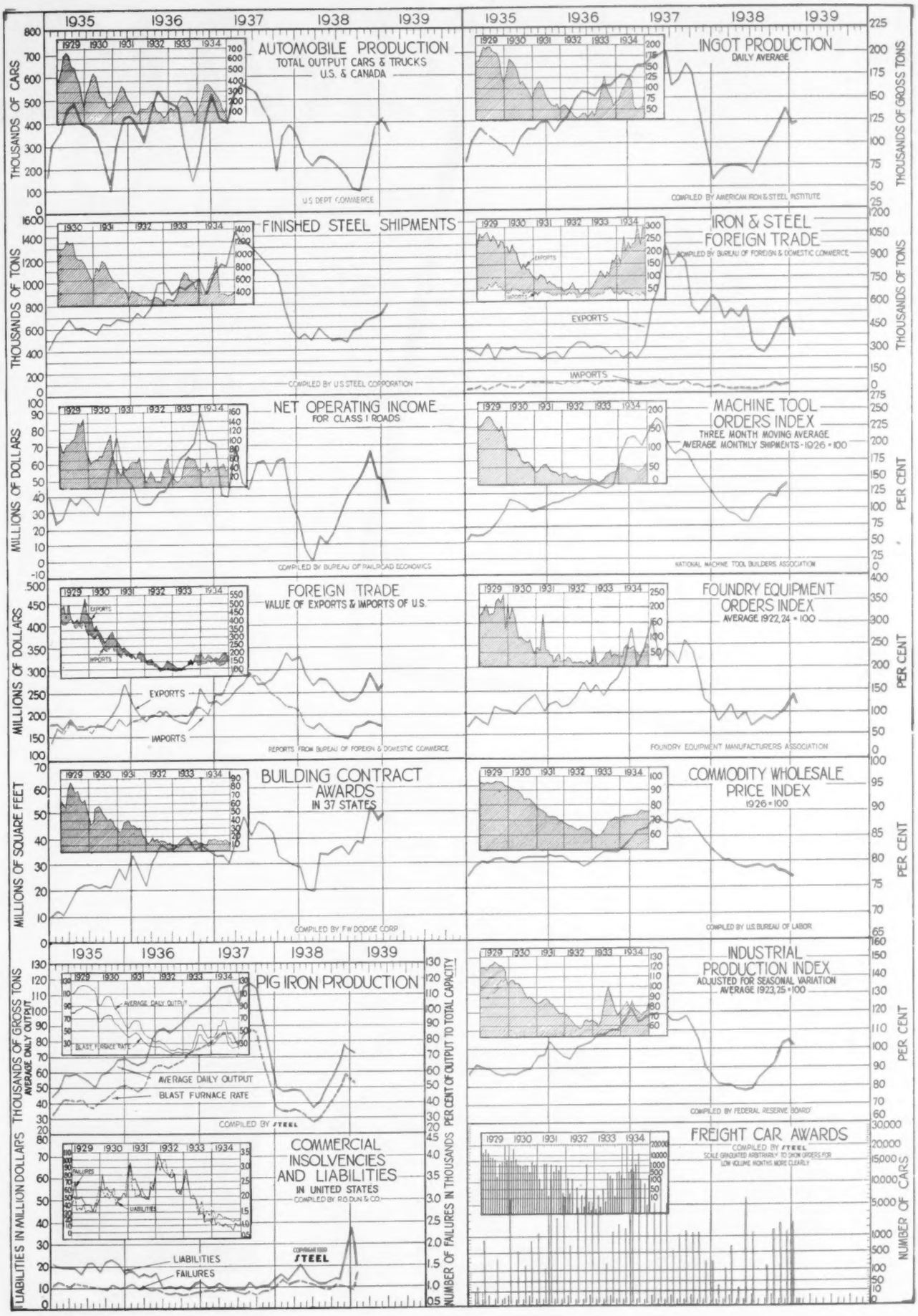




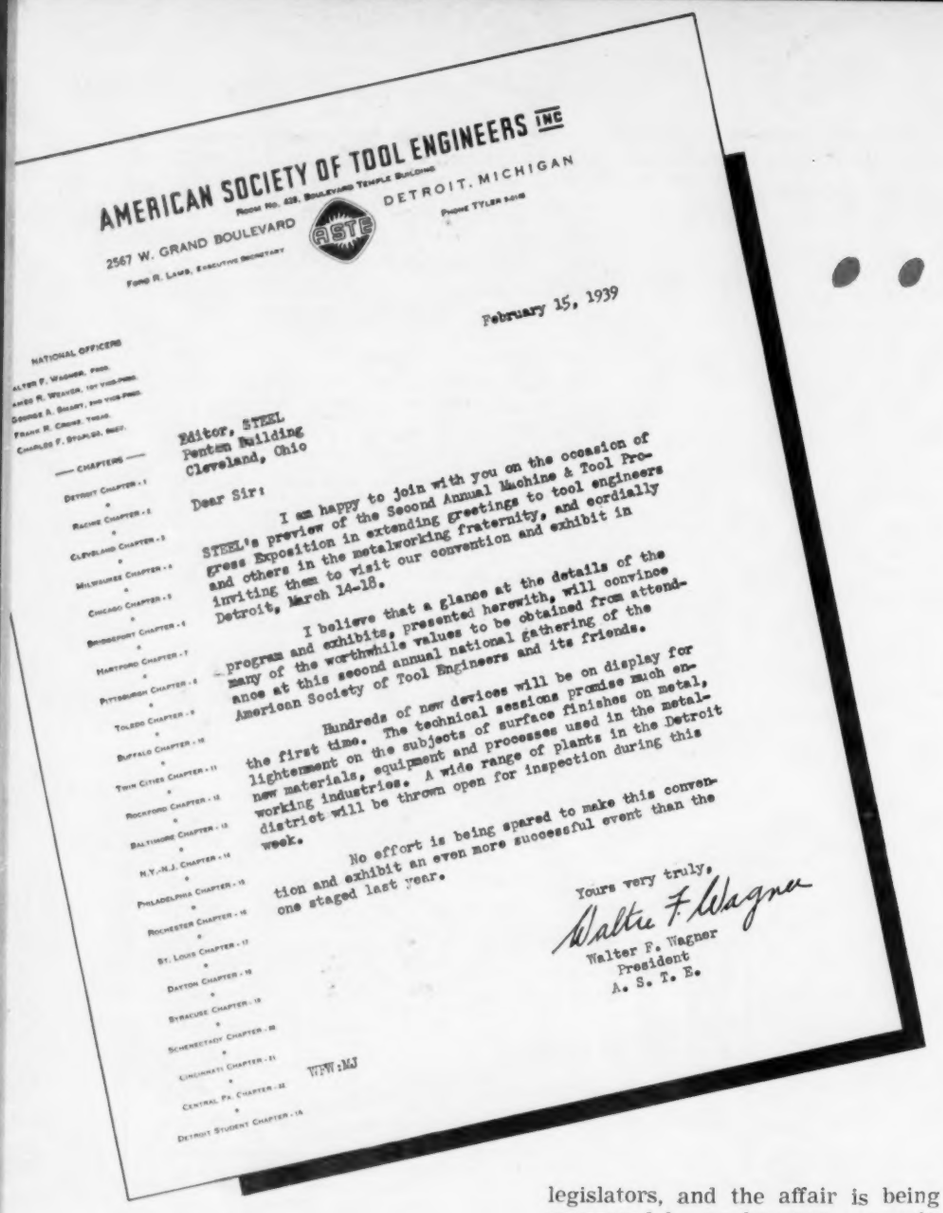


Week ending	Steelworks Operating Rate Per Cent 1938	1932	1929	Electric Power Output Million KWH 1938	1932	1929	Freight Car Loadings Thousands of Cars 1938	1932	1929	Weekly Auto Output 1938	1932	1929
Nov. 19	63.0	19.0	73.0	2,270	1,582	1,794	657	576	983	96,735	16,497	49,160
Nov. 26	62.0	17.5	71.0	2,183	1,475	1,818	562	494	950	84,930	13,389	38,219
Dec. 3	61.0	16.0	69.5	2,285	1,510	1,718	649	547	837	97,795	12,398	28,079
Dec. 10	61.0	15.0	67.0	2,318	1,519	1,806	619	521	937	100,705	21,695	31,255
Dec. 17	58.0	14.0	63.5	2,332	1,563	1,841	606	517	923	102,902	30,589	33,293
Dec. 24	52.0	12.0	63.5	2,362	1,554	1,860	574	495	843	92,890	27,396	23,216
Dec. 31	40.0	13.0	38.5	2,120	1,415	1,638	500	407	638	75,215	25,598	23,967

	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929	1939	1938	1932	1929
Jan. 7	51.5	26.0	25.0	84.0	2,169	2,139	1,619	1,542	531	552	573	799	76,685	54,084	30,755	75,000
Jan. 14	52.0	29.0	26.0	82.0	2,269	2,115	1,602	1,734	587	580	572	914	86,925	65,735	31,416	95,000
Jan. 21	51.5	30.5	27.0	83.0	2,289	2,108	1,598	1,737	590	570	562	932	90,205	65,418	29,365	105,000
Jan. 28	51.5	33.0	28.5	84.0	2,292	2,098	1,588	1,717	594	553	560	926	89,200	59,365	28,950	115,000
Feb. 4	53.0	31.0	28.5	85.0	2,287	2,082	1,588	1,728	577	564	575	947	79,410	51,443	27,110	116,000
Feb. 11	54.0	30.0	27.0	86.0	2,268	2,052	1,578	1,726	580	543	562	956	84,500	57,810	29,320	116,000
Feb. 18	55.0	31.0	25.0	88.0	2,249	2,059	1,545	1,718	580	536	572	958	79,860	59,100	30,410	116,500
Feb. 25	55.0	30.5	25.0	83.0	2,226	2,031	1,512	1,699	561	512	636	907	75,660	56,977	30,150	116,500


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT COMMERCE
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS - 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922,24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACT AWARDS IN 37 STATES
COMPILED BY F.W. DODGE CORP.
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923,25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
COPYRIGHT 1939 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW-VOLUME MONTHS MORE CLEARLY
THOUSANDS OF CARS
THOUSANDS OF TONS
MILLIONS OF DOLLARS
MILLIONS OF SQUARE FEET
THOUSANDS OF GROSS TONS
AVERAGE DAILY OUTPUT
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
PER CENT OF OUTPUT TO TOTAL CAPACITY
PER CENT
NUMBER OF CARS

. . . TOOL



AMERICAN SOCIETY OF TOOL ENGINEERS INC

2567 W. GRAND BOULEVARD — DETROIT, MICHIGAN

February 15, 1939

Editor, STEEL
Penton Building
Cleveland, Ohio

Dear Sir:

I am happy to join with you on the occasion of STEEL's preview of the Second Annual Machine & Tool Progress Exposition in extending greetings to tool engineers and others in the metalworking fraternity, and cordially inviting them to visit our convention and exhibit in Detroit, March 14-18.

I believe that a glance at the details of the program and exhibits, presented herewith, will convince many of the worthwhile values to be obtained from attendance at this second annual national gathering of the American Society of Tool Engineers and its friends.

Hundreds of new devices will be on display for the first time. The technical sessions promise much enlightenment on the subjects of surface finishes on metal, new materials, equipment and processes used in the metalworking industries. A wide range of plants in the Detroit district will be thrown open for inspection during this week.

No effort is being spared to make this convention and exhibit an even more successful event than the one staged last year.

Yours very truly,
Walter F. Wagner
Walter F. Wagner
President
A. S. T. E.

WFW:MJ

■ CALCULATED to keynote the 1939 convention and exhibition of the American Society of Tool Engineers in Detroit, March 14-18, will be the first formal report of the society's fact-finding committee, headed by John M. Younger, professor of industrial engineering, Ohio State university, Columbus, O., which for the past several months has been assembling data on the relationship of the machine to employment and standards of living.

The subject is of vital concern to everyone in industry today, and the A.S.T.E. has appropriated a considerable sum of money for this factual investigation in the belief the results will pay dividends to its members and industry in general. Hence the preliminary findings are being awaited eagerly.

The presentation will be made at a preview dinner scheduled for March 13, the evening before the formal opening of the second Machine and Tool Progress exhibition. Guests will be leading industrialists, educators, editors, clergymen and legislators, and the affair is being sponsored by an honorary committee headed by K. T. Keller, president, Chrysler Corp., Detroit.

Advance reports indicate Prof. Younger's committee has accumulated a large mass of facts which throw light on the various relationships of the machine and employment, the machine and living standards, inter-relationship of industry and agriculture as affected by the machine, contributing factors of legislation, taxation, labor organization and the like; creation of "service" employment; temporary and permanent unemployment; and the effect of the machine on business cycles.

"The crux of the problem," declares Prof. Younger, "seems to be whether it is advisable to have few men temporarily displaced with resultant gain to many, or whether we should consider temporary displacement of these men as our most serious ailment."

Personnel of the fact-finding committee is as follows: Prof. Younger, chairman; James R. Weaver, director of equipment purchases, inspection and tests, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; John J. Caton, director, Chrysler Institute of Technology, Detroit; Prof. O. W. Boston, director, metal processing department, University of Michigan, Ann Arbor, Mich.; Carl W. Horack, assistant chief engineer, Merco Nordstrom Valve Co., Pittsburgh; L. Clayton Hill, factory manager, Murray Corp., Detroit; E. W. Dickett, tool engineer, Sundstrand Machine Tool Co., Rockford, Ill.; and Ford R. Lamb, executive secretary, A. S. T. E., Detroit.

Feature address of the preview dinner will be presented by Harold Glenn Moulton, president, Brookings institution, Washington. Dr. Moulton, president of the institution since its formation in 1927, will relate his comment to the subject of the evening — mechanization and its effects.

An innovation in the convention program proper, as revealed by the

John M. Younger
Chairman, A. S. T. E. fact-finding committee

ENGINEERS

Crown Achievements with Greatly Enlarged Show and Convention

Walter F. Wagner
President, American Society of Tool Engineers

James R. Weaver
First vice president, American Society of Tool Engineers

condensed summary appearing on a subsequent page, is the scheduling of the two technical sessions in the evening, to facilitate a wider attendance and to avoid detracting from the comprehensive exhibition which is to be running concurrently. Furthermore, the absence of technical sessions during the day will permit those who wish to take advantage of both plant visitation trips and technical sessions to do so.

Climax of scheduled events for the week will be the annual dinner of the society planned for Friday evening, March 17. The dinner will be followed by brief transaction of routine business and a featured address by William B. Stout, president, Stout Engineering Laboratories, Detroit. Famed for his forensic abilities as well as his intimate knowledge of technical developments, especially as related to automobiles and aircraft, Mr. Stout will speak on "The Tool Engineer's Contributions to Civilization."

Harold G. Moulton
Principal speaker at preview dinner on March 13

It is planned to continue the policy adopted last year by the A.S.T.E. of rebating to all members attending the show at their own expense a portion of their railroad fare to Detroit, thus enabling members to share directly in the success of the 1939 exhibition.

A registration fee of 50 cents will be charged at Convention hall for all nonmembers. not provided with invitations. This restriction has been decided upon as a means of confining attendance at the exhibit to those having a definite business interest in the affair, and it is hoped the plan will provide maximum opportunity to inspect the 250-odd exhibits at close range. Last year, with no restrictions imposed, registrations at the exhibition totaled about 27,000 and at times the crowding was excessive.

The American Society of Tool Engineers is a relative newcomer to the ranks of technical societies, and its growth has been little short of miraculous. Starting in 1932 from an organization of 33 members in Detroit, it has bloomed into a nation-wide network of 26 chapters, including two junior chapters. Last year the society staged its first exhibition of machines and tools, attracting about 160 exhibitors to Detroit's Convention hall. The event was considered such an unqualified success that it was determined to repeat it this year, and the response by exhibitors resulted in a show this year estimated to be nearly twice the size of the one a year ago.

Whether the Machine and Tool Progress exhibition has now joined the ranks of annual events remains to be seen, but there is some reason to believe it will be continued in future years, although perhaps on a biennial basis.

National officers of the society are: President, Walter F. Wagner, master mechanic, Lincoln Motor Car Co., Detroit; first vice president, James R. Weaver, director of equipment purchases, inspection and tests, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; second vice president, George A. Smart, tool supervisor, Acme Machinery Co., Cleveland; treasurer, Frank R. Crone, chief tool designer, Lincoln Motor Car Co., Detroit; secretary, Charles F. Staples, tool engineer, Giern & Anholtt Co., Detroit; and executive secretary, Ford R. Lamb, 2567 West Grand boulevard, Detroit.

The 1939 show committee of the society is headed by Frank Shuler, master mechanic, Chrysler Corp., Detroit, and past president of the society. Program details were developed by a committee in charge of Homer C. Bayliss, Motch & Merryweather Machinery Co., Detroit.

Participate in Mechanical Surface Finishing Symposium

D. A. Wallace

H. J. Griffing

K. W. Connor

I. J. Snader

F. T. Ellis

Many Plant Visitations Scheduled

■ Arrangements have been made for plant inspection trips to the following companies located in the Detroit area. Date and time of trips are available upon registration for attendance.

Cadillac Motor Division
Chrysler Division
De Soto Division
Dodge Division
Dodge Truck Division
Hudson Motor Car Co.
Packard Motor Car Co.
Plymouth Motor Division
Rotary Electric Steel Co.
Timken-Detroit Axle Co.
United States Rubber Co.

In addition, about 25 smaller plants in various fields will be open for inspection during the week. Details can be obtained at the registration desk in Convention Hall.

C. J. Oxford

Convention and Exhibition Program Packed with Activity

Tuesday, March 14

9:00 a.m.—Exhibit opens.
Registration of members and visitors.
9:30 a.m.—Plant inspection trips.
1:30 p.m.—Plant inspection trips.
6:00 p.m.—Exhibit closes.

Wednesday, March 15

9:00 a.m.—Exhibit opens.
9:30 a.m.—Plant inspection trips.
1:30 p.m.—Plant inspection trips.
8:00 p.m.—First technical session in Convention Hall Annex.

A Symposium on Mechanical Surface Finishing

Chairman: C. J. Oxford, chief engineer, National Twist Drill & Tool Co., Detroit.
Introduction and general discussion by J. R. Weaver, director of equipment purchases, inspection and tests, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Grinding," by Ira Snader, chief engineer, Ex-Cell-O Corp., Detroit.
"Honing," by Kirke W. Connor, president, Micromatic Hone Corp., Detroit.
"Lapping," by H. J. Griffing, sales research engineer, Norton Co., Worcester, Mass.
"Diamond Boring and Finishing," by F. T. Ellis, Heald Machine Co., Worcester, Mass.
"Superfinishing," by D. A. Wallace, president, Chrysler Sales Division, Chrysler Corp., Detroit.
"Measurements of Surface Finish," by Dr. Ernest Abbott, president, Physicists' Research Co., Ann Arbor, Mich.
10:00 p.m.—Exhibit closes.

Thursday, March 16

9:00 a.m.—Exhibit opens.
9:30 a.m.—Plant inspection trips.
10:00 a.m.—Board of directors meeting at Fort Shelby hotel.
1:30 p.m.—Plant inspection trips.
6:00 p.m.—Exhibit closes.
6:30 p.m.—Annual dinner at Book-Cadillac hotel.
Presiding: President Walter F. Wagner.
Reports of national officers.
Installation of new officers.
Address: "The Tool Engineer's Contributions to Civilization," by William B. Stout, president, Stout Engineering Laboratories, Detroit.

Friday, March 17

9:00 a.m.—Exhibit opens.
9:30 a.m.—Plant inspection trips.
10:00 a.m.—Standards Committee meeting at Fort Shelby hotel.
1:30 p.m.—Plant inspection trips.
8:00 p.m.—Second technical session in Convention Hall Annex.

New Developments and Their Effect on the Tool Engineer

Chairman: Chris Borneman, supervisor, tool and gage department, General Electric Co., Schenectady, N. Y.
"Hydraulic Units," by K. R. Herman, vice president, Vickers Inc., Detroit.
"Gages," by C. Johnson, Pratt & Whitney Division, Niles-Bement-Pond Co., Hartford, Conn.
"Cutting Tools," by L. C. Gorham, Gorham Tool Co., Detroit.
"Gear Tooth Finishing," by R. Drummond, National Broach & Machine Co., Detroit.
"Effect of Lapping or Honing of Cutting Edges of Tools," by John Lindegren, Crompton & Knowles Loom Works, Worcester, Mass.
10:00 p.m.—Exhibit closes.

Saturday, March 18

9:00 a.m.—Exhibit opens.
9:30 a.m.—Tour of Greenfield Village, Dearborn, Mich.
6:00 p.m.—Exhibit closes.

Exhibitors in Machine and Tool Progress Show

Convention Hall, Detroit, March 14-18

Abrasive Co., Philadelphia A-19
Abrasive grinding wheels; abrasive grain.

Abrasive Dressing Tools Co., Detroit A-1
Diamond wheel dressing tools; process for making them.

Allen Mfg. Co., Hartford, Conn. B-68
Set screws; cap screws; pipe plugs.

Allis-Chalmers Mfg. Co., Milwaukee A-69
Electrical equipment.

American Broach Sales Co., Ann Arbor, Mich. C-14
Broached parts; broaching tools; hydraulic pump unit.

American Chain & Wright Hoist Divisions, American Chain & Cable Co., Bridgeport, Conn. A-73
Chain and hoists.

American Equipment Co., Detroit A-4
Air equipment; chucks and collets; hydraulic pumps.

American Optical Co., Southbridge, Mass. B-100
Eye protection equipment.

American Saw & Mfg. Co., Detroit B-10
Automatic metal cutting power hacksaw; saw blades.

American Swiss File & Tool Co., Elizabeth N. J. B-100
Swiss pattern files.

Anderson & Sons, Springfield, Mass. B-39
Nameplate imprinting equipment.

Apex Machine & Tool Co., Dayton, O. A-58
Wrenches; tools; tool holders; chucks.

Armstrong-Blum Mfg. Co., Chicago C-64
Saws.

Armstrong Bros. Tool Co., Chicago C-68
Forged tool holders; clamps; wrenches.

Atlas Press Co., Kalamazoo, Mich. A-16
Precision lathe; shaper; drill presses; arbor presses; motors and grinders.

Automotive Maintenance Machinery Co., Chicago B-24
Tension indicators; precision shaper.

Barber-Colman Co., Rockford, Ill. A-39
Small tools.

W. O. Barnes Co., Detroit A-85
Band saws.

Barrett-Cravens Co., Chicago B-55
Lift-trucks; portable elevators; skids; scale truck.

John Bath & Co. Inc., Worcester, Mass. A-3
Thread taps; thread gages; micrometers; roll threading dies.

Bausch & Lomb Optical Co., Rochester, N. Y. B-74
Optical instruments.

Black & Decker Mfg. Co., Towson, Md. C-41
Portable electric tools.

Blank & Buxton Machine Co., Jackson, Mich. C-16
High-speed vertical mill.

Boyar-Schultz Corp., Chicago C-82
Profile grinder; bolts; laps.

Boyer-Campbell Co., Detroit B-100
Safety equipment; flexible shafts; hoists; saws; precision files.

Bridgeport Machines Inc., Bridgeport, Conn. A-77
High-speed milling attachments; turret milling machine.

Bristol Co., Waterbury, Conn. A-18
Socket-head cap screws; screw products.

O. F. Brooks, Chicago C-48A
Microscopes and magnifying glasses.

Brown & Sharpe Mfg. Co., Providence, R. I. A-6
Tools and cutters.

Charles Bruning Co. Inc., New York A-38
Drafting machine; printing process machine.

Andrew C. Campbell Division, American Chain & Cable Co., Bridgeport, Conn. B-8
Abrasive cutting machine; nibbling machines.

Carboloy Co. Inc., Detroit B-43
Cemented carbide tools and dies.

Carborundum Co., Niagara Falls, N. Y. A-2
Abrasive products.

Charron Engineering Sales, Detroit B-9
Hoists; riveting equipment.

Chicago Rivet & Machine Co., Chicago A-99
Rivet setting machines.

Chisholm-Moore Mfg. Co., Tonawanda, N. Y. B-100
Hoists; chains.

Chrysler Corp., Detroit A-12
Superfinished parts.

Circular Tool Co. Inc., Providence, R. I. A-91
Circular cutting saws; center drills; reamers; knives.

Cogsdill Twist Drill Co., Detroit B-53
Bearing tools and machine.

Colonial Broach Co., Detroit A-42
Broaches.

Colonial Bushings Inc., Detroit A-42
Drill jig bushings; screw machine parts.

Arthur A. Crafts Co., Inc., Boston C-10
Tools; gages; dies.

Cushman Chuck Co., Hartford, Conn. B-52
Manual and power-operated chucks.

DAILY METAL TRADE, Cleveland A-60
Publications and technical books.

Dalrae Tools Co., Syracuse, N. Y. B-3
Milling machines with preset tools.

Davis Boring Tool Co. Division, Larkin Packer Co., Inc., St. Louis A-100
Boring tools; facing tools; reamers.

Dayton Rogers Mfg. Co., Minneapolis A-26
Stampings made by special process.

Dazor Mfg. Co., St. Louis B-76
Floating lamp.

Delta Mfg. Co., Milwaukee B-34
Drill presses; tool grinders; band saw.

A. P. deSanno & Son, Philadelphia A-78
Abrasive cutoff machines.

Detroit Broach Co., Detroit B-60
Broaches; broaching equipment.

Detroit Power Screwdriver Co., Detroit C-89
Automatic screw-driving machines; special hoppers.

Detroit Tap & Tool Co., Detroit A-42
Taps; gages; threaded parts.

Jules Dierckx, New York B-39A
Hydraulic portable tables.

Eugene Dietzgen Co., Chicago B-7
Drafting, surveying and reproduction supplies.

Dumore Co., Racine, Wis. B-72
Electric tools; motors; grinders.

East Shore Machine Products Co., Cleveland B-16
Keyway cutting broaches.

Eclipse Counterbore Co., Detroit B-80
Boring tools.

Electro-Lift Inc., New York B-9
Hoists.

Electro-Matic Products Co., Chicago B-21
Electromagnetic chucks.

Esco Engineering & Sales, Detroit A-21

Ettco Tool Co., Brooklyn, N. Y. A-92
Drill and tap heads; chucks; tapping machines.

Exact Weight Scale Co., Columbus, O. C-38-B
Grading scales.

Ex-Cell-O Corp., Detroit A-32
Grinding spindles; cutting tools; broaches; drill jig bushings.

Falcon Tool Co., Detroit C-32A
High speed metal cutting tools.

J. N. Fauver Co. Inc., Detroit C-69
Lubricators; filters; hydraulic fittings; valves, hose couplings; air lubricators; regulators and pumps.

Federal-Mogul Corp., Detroit C-71
Bearings; bushings; castings; bars.

Federal Products Corp., Detroit A-9
Precision measuring instruments.

Fellows Gear Shaper Co., Springfield, Vt. A-31
Gear and cutter measuring and checking equipment; tools and gear shaper cutters.

Firth-Sterling Steel Co., McKeesport, Pa. A-95
Electric tool brazing furnace.

Ford Motor Co., Dearborn, Mich. A-23
Gage blocks and accessories.

THE FOUNDRY, Cleveland A-60
Publications and technical books.

Fredericksen Co., Saginaw, Mich. B-100
Bronze seals.

Gairing Tool Co., Detroit B-44
Cutting tools.

Galland-Henning Mfg. Co., Milwaukee C-72
Air valves; air cylinders.

Gammons-Holman Co., Manchester, Conn. B-16
Reamers; end mills.

James W. George, Detroit A-41
Metal cutting machines; tools.

L. H. Gilmer Co., Philadelphia B-100
Belting.

J. C. Glenzer Co., Detroit C-15
Live centers; floating holders; sleeves; checks; counterbores; reamers.

Goddard & Goddard Co. Inc., Detroit A-86
Milling cutters; reamers; gear and spline hobs.

Harvey Goldman & Co., Detroit B-38
New and rebuilt machinery.

Good-Speed Detroit Co., Detroit B-16
Speed lathes; drill presses; drill chucks; mandrels; reamers; milling cutters.

Gorham Tool Co., Detroit A-36
Milling cutters; reamers; end mills; form tools.

Govro-Nelson Co., Detroit B-53
Automatic drilling units.

Greenfield Tap & Die Co., Greenfield, Mass. A-34
Tapping machines; tools.

Grinding Machinery Co., Detroit B-21
Grinding and lapping equipment; filters; demagnetizers.

Grob Bros. Inc., Grafton, Wis. B-54
Bandsaws; filing machines; butt welders, brazers.

Hamilton Mfg. Co., Two Rivers, Wis. A-56
Steel filing cabinets; drafting tables; chairs.

Hammond Machinery Builders Inc., Kalamazoo, Mich. C-91
Automatic polishing and buffing machines.

Hanna Engineering Works, Chicago B-9
Riveting machines; air and hydraulic cylinders.

Hannifin Mfg. Co., Chicago A-33
Presses and riveting equipment.

Hanson Whitney Machine Co., Hartford, Conn. C-59
Taps; thread gages; cutters; precision screws.

Hardinge Bros. Inc., Elmira, N. Y. C-86
Collets; collet chucks; collet index fixtures.

Haynes-Stellite Co., New York B-26
Cutting tools; wear and corrosion resistant alloys.

Heim Co., Fairfield, Conn. B-16
Die polishing machine.

Heller Bros. Co., Detroit B-73
Files.

Hole Engineering Service, Detroit B-53
Drilling machines, grinding and boring spindles; portable electric grinders, reaming machines.

Holo-Krome Screw Corp., Hartford, Conn. A-63
Socket set screws, cap screws; pipe plugs; wrenches.

E. F. Houghton & Co., Philadelphia C-61
Lubricants; cutting oils; leather belts.

Hovis Screwlock Corp., Detroit B-19
Interchangeable punches; button dies; retainers; die accessories.

Howell Electric Motors, Howell, Mich. C-83
Motors.

C. B. Hunt & Son, Salem, O. C-32B
Control valves for air, water, oil.

Huot Mfg. Co., St. Paul B-75
Drill indexing device.

Illinois Testing Laboratories Inc., Chicago B-25
Temperature measuring instruments; air velocity meters.

Illinois Tool Works, Chicago B-36
Gear checking equipment.

Independent Pneumatic Tool Co., Chicago C-33
Universal and high-frequency electric portable tools.

Ingersoll Milling Machine Co., Rockford, Ill. A-8
Inserted blade cutters.

International Nickel Co. Inc., New York C-65
Nickel alloy steels, cast irons; brasses, bronzes.

Jacobs Mfg. Co., Hartford, Conn. A-65
Drill chucks.

Charles T. Jarvis Co., Middletown, Conn. A-48
Flexible shaft machines; tapping attachments; chucks, collets.

Johnson Bronze Co., New Castle, Pa. C-8
Bearings; bushings; bar bronze; babbitt.

Jones-Fors Co., Detroit A-57
Screw driver bits; files; grinders; tools.

Jones & Lamson Machine Co., Springfield, Vt. A-50
Comparators.

Koebel Diamond Tool Co., Detroit A-53
Diamond tools.

Lee Machinery Co., Detroit A-28
Lathes.

K. O. Lee & Son Co., Aberdeen, S. Dak. B-16
Tool and cutter grinders; chucks; mandrels; arc welder.

Leland-Gifford Co., Worcester, Mass ....
Jig bushings; hardened and ground parts.

LeMaire Tool & Mfg. Co., Dearborn, Mich. A-25
Hydraulic units; machinery; tools.

Lenney Machine & Mfg. Co., Warren, O. B-16
Variable-speed transmissions.

Link Engineering & Mfg. Co., Detroit A-17
Spring checking equipment.

Logansport Machine Inc., Logansport, Ind. A-4
Air equipment; chucks; collets, hydraulic pumps.

Lufkin Rule Co., Saginaw, Mich. A-74
Precision tools; measuring tapes; rules.

M-B Products, Detroit A-84
Pneumatic tools; lubricators; filters.

MACHINE DESIGN, Cleveland A-60
Publications and technical books.

Macklin Co., Jackson, Mich. B-5
Grinding wheels.

Manufacturers Brush Co., Cleveland B-100
Wire wheels and brushes.

Manufacturers Sales Co., Detroit C-88, C-90
High speed tappers; flexible shaft equipment.

Marburg Bros. Inc., New York C-7
Jig borer; die sawing and filing machine.

Martindale Electric Co., Cleveland B-15
Flexible shaft unit; protective masks, rotary files, burrs.

McCaskey Register Co., Alliance, O. B-80
Inventory and control systems; records.

McCrosky Tool Corp., Meadville, Pa. A-45-A
Reamers; boring bars; milling cutters; chucks; tool posts.

Michigan Tool Co., Detroit A-42
Gear making equipment; cutting tools.

Micromatic Hone Corp., Detroit C-96
Honing equipment.

Midwest Production Engineering Co., Detroit A-10
Hydraulic piercing equipment.

Midwest Tool & Mfg. Co., Detroit A-45-B
Adjustable holders; counterbores.

Minster Machine Co., Minster, O. B-31
Presses.

Modern Collet & Machine Co., Ecorse, Mich. B-58
Automatic screw machine; collets; feed fingers; cams.

Morrison Machine Products Division, Elmira, N. Y. C-85
Screw machine collets; feed fingers.

Motor Tool Mfg. Co., Detroit C-11
Drill chuck; centers.

Mueller Brass Co., Port Huron, Mich. C-18
Bearing alloy; brass forgings.

National Automatic Tool Co., Richmond, Ind. A-35
Drilling, boring and tapping machinery.

National Broach & Machine Co., Detroit A-49
Gear checker; gear speeder; lead comparator.

National Tool Salvage Co., Detroit A-82
Refinished tools.

New Britain-Gridley Machine Division, New Britain Machine Co., New Britain, Conn. A-76
Collets.

NEW EQUIPMENT DIGEST, Cleveland A-60
Publications and technical books.

New Method Steel Stamps Inc., Detroit A-42
Marking devices; steel stamps; rolls; dies.

Nicholson File Co., Providence, R. I. A-66
Files and rasps.

Nielsen Inc., Lawton, Mich. B-16
Live centers.

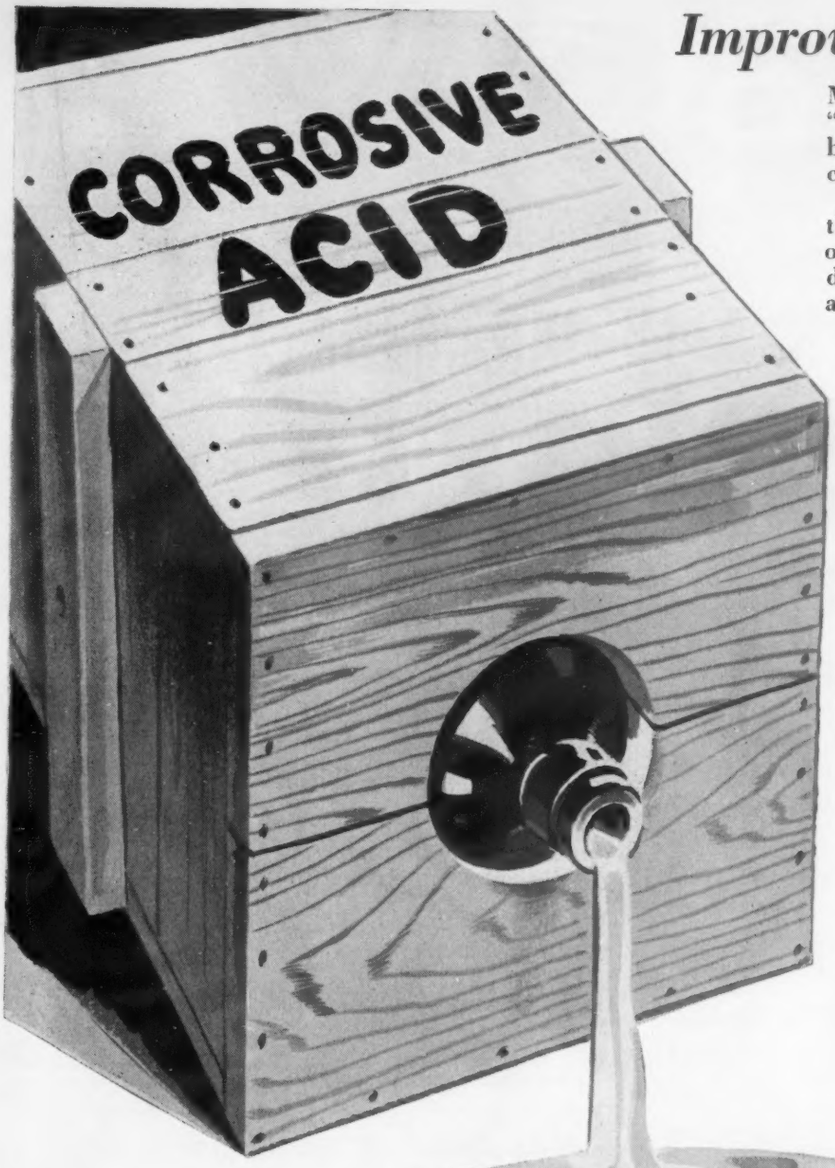
Norton Co., Worcester, Mass. A-47
Abrasives.

O.K. Tool Co. Inc., Shelton, Conn. B-48
Milling cutters; reamers; boring heads; counterbores.

Ozalid Corp., New York B-28
White print machines.

Paragon-Revolute Corp., Rochester, N. Y. B-12
Automatic blue printing machines.

Parker-Kalon Corp., New York C-80
Socket screws; self-tapping screws.



Improved acid resistance

Many a corrosive solution classified as a "tough customer" becomes much better behaved . . . when Tellurium Lead takes charge.

This claim is not based on something that happened in a test tube. It is founded on *user reports* from many different industries—from plants handling sulphuric and other corrosive acids under conditions of extreme severity, even at temperatures that approach the melting point of the metal. In case after case, Tellurium Lead has prolonged the life of equipment and reduced the number of shut-downs for repairs.

Another highly important property of Tellurium Lead is this: *It toughens under stress.* When rolled, stretched or hammered, it actually becomes stronger. As a result, turnover points and joints are less subject to cracking. Furthermore, where vibration occurs, this capacity to develop latent strength minimizes buckling and creeping. It also gives Tellurium Lead improved resistance to fracture due to repeated heat changes.

Tellurium Lead of our manufacture is time-tested St. Joe chemical lead alloyed with a small quantity of tellurium. It gives the advantages of this well-known chemical lead plus important new ones. Yet now it costs only a fraction of a cent more per pound than chemical lead. Available in sheets, pipe and coils. For further facts, write our nearest branch.

Typical User Reports

"1¼" x 6 lbs. Tellurium Lead coils is used in a bath of 10 to 20% sulphuric acid and water with a steam pressure of 5 to 15 lbs. and a temperature of 170° F. Tellurium Lead has not shown any signs of oxidation after four or five times the length of service of lead formerly used."

• • •

"We have been using Tellurium Lead in steam injector pipes for acid service," another user reports. "We find that the material has a distinct advantage over lead formerly used. It gives the added rigidity and resistance to deformation needed under the conditions present."

I THOUGHT I WAS TOUGH . . . TILL I MET

TELLURIUM LEAD

NATIONAL LEAD COMPANY

New York, Baltimore, Buffalo, Chicago, Cleveland, Cincinnati, St. Louis; National-Boston Lead Co., Boston; John T. Lewis & Bros. Co., Philadelphia; National Lead & Oil Co., Pittsburgh; Georgia Lead Works, Atlanta; American Lead Corp., Indianapolis; Master Metals, Inc., Cleveland; The Canada Metal Co., Ltd., Toronto, Montreal, Winnipeg, Vancouver.

C. F. Pease Co., Chicago A-46
Blueprinting machines.

Penton Publishing Co., Cleveland A-60
Publications and technical books.

George H. Pfeil Inc., Detroit C-37-B
Steel stitchers; stapling machines; tackers.

Physicists Research Co., Ann Arbor, Mich. A-59
Instruments for measuring surface finish.

Pioneer Engineering & Mfg. Co., Detroit C-78
Coolant and lubricant pumps.

Positive Safety Mfg. Co., Cleveland B-100
Safety devices for power presses.

Pratt & Whitney Division, Niles-Bement-Pond Co., Hartford, Conn. A-37
Gages.

H. P. Preis Engraving Machine Co., Newark, N. J. C-39
Engraving machines; die sinkers; milling machines.

Producto Machine Co., Detroit C-36A
Die sets; tool room accessories.

Progressive Welder Co., Detroit C-30
Spot welder; welding accessories.

Putnam Tool Co., Detroit B-66
Cutting tools; grinding fixtures.

Pyro-Electro Instrument Co., Detroit A-87
Hardness testing machines.

Q C Engineering Products Co., Detroit A-5
Index tables, drill heads; fixtures; air valves.

Racine Tool & Machine Co., Racine, Wis. B-56
Hydraulic pumps; valves and controls.

T. B. Rayl Co., Detroit A-67

Ready Tool Co., Bridgeport, Conn. A-90
Tool holders; dogs; centers.

Reeves Pulley Co., Detroit C-94
Variable-speed control equipment.

Ross Operating Valve Co., Detroit A-89
Control valves.

Rotor Tool Co., Cleveland B-50
Portable electric tools.

Schauer Machine Co., Cincinnati B-16
Speed lathes for lapping, burring, polishing.

George Scherr & Co., New York C-57

A. Schrader's Son Division, Scovill Mfg. Co. Inc., Brooklyn, N. Y. C-67
Air and hydraulic equipment.

Scully-Jones & Co., Chicago C-63
Reamers; counterbores; drill and tap drivers.

Seamlex Co., Long Island City, N. Y. B-16
Flexible metal hose.

Severance Tool Mfg. Co., Saginaw, Mich. A-88
Milling cutters; countersinks; special cutters.

Shakeproof Lockwasher Co., Chicago B-36
Lock washers; screws; inspection equipment; small tools.

Sheffield Gage Co., Dayton, O. B-1
Gages.

Siewek Tool Co., Ferndale, Mich. C-40

Singer Sewing Machine Co., Detroit A-40
Industrial sewing machines.

Skinner Chuck Co., New Britain, Conn. B-100
Chucks; chucking machines.

Roy Smith-Hobart Arc Welder Sales & Service, Detroit C-98
Welding equipment.

Snyder Tool & Eng. Co., Detroit B-46

Socony-Vacuum Oil Co., New York B-49
Lubricants and cutting fluids.

Standard Gage Co., Poughkeepsie, N. Y. B-52
Gages.

Standard Shop Equipment Co., Philadelphia A-29
Set-up equipment.

Stanley Electric Tool Division, Stanley Works New Britain, Conn. B-18
Portable electric tools.

L. S. Starrett Co., Athol, Mass. A-64
Precision tools; dial indicators; hacksaws; steel tapes.

STEEL, Cleveland A-60
Publications and technical books.

Stokerunit Corp., Milwaukee A-81
Precision boring machines.

N. A. Strand & Co., Chicago B-100
Flexible shafts and equipment.

Charles A. Strelinger Co., Detroit C-74
Wire stitching machines.

Strong-Carlisle & Hammond Co., Cleveland A-83
Cap screws; set screws.

D. A. Stuart Oil Co., Chicago A-97
Lubricants and cutting oils.

Sunnen Products Co., St. Louis B-53
Honing machines; portable hones.

Super Tool Co., Detroit A-22
Tungsten carbide tools; diamond tools.

Sutton Tool Co., Detroit A-45-C
Collets; feeders.

Swartz Tool Products Co. Inc., Detroit A-14
Jigs; fixtures; locks.

Swedish Gage Co. of America, Detroit A-24
Micrometers; gages; drill chucks.

T C M Harrison Machine Works, Harrison, N. J. C-36-B
Grinding and lapping machine; brazing fixtures.

Taft-Peirce Mfg. Co., Woonsocket, R. I. C-100
Gages; magnetic chucks; surface grinder; small tools.

Tanewitz Works—Bertsch Machinery Co., Grand Rapids, Mich. B-10
Sawing, abrasive cutoff and mitering machines.

Texas Co., New York C-37A
Lubricants and cutting fluids.

Thomas Machine Mfg. Co., Pittsburgh A-20
Power presses.

Tinnerman Stove & Range Co., Speed Nut Division, Cleveland B-11
Speed nut fasteners and applications.

Tomkins Johnson Co., Jackson, Mich. B-33
Riveting machines; air cylinders; coolant pumps; cutters.

Towmotor Co., Cleveland C-92
Telescopic fork lift truck.

Tungsten Carbide Tool Co., Detroit A-42
Tungsten carbide tipped tools.

United States Electrical Tool Co., Cincinnati A-71
Electric tools; drills; grinders; polishers.

Universal High-Speed Tool Co., Cleveland B-23
Milling, drilling and boring head.

Vanadium-Alloys Steel Co., Latrobe, Pa. B-51
High speed and alloy tool steels.

Van Dorn Electric Tool Co., Detroit C-41
Portable electric tools.

Vickers Inc., Detroit A-11
Hydraulic pumps and controls.

Victor Saw Works, Inc., Middletown, N. Y. B-100
Saw blades; precision lawn mower.

Vinco Tool Co. Inc., Detroit C-1
Tools and gages.

R. A. Vine Machinery, Detroit A-27
Pneumatic die cushions.

Walker-Turner Co. Inc., Plainfield, N. J. C-54
Drill presses; flexible shafts; metal cutting bandsaw.

Welding Equipment & Supply Co., Detroit C-42
Welding wire and electrodes.

Weldit Acetylene Co., Detroit C-43
Welding equipment.

Weldon Tool Co., Cleveland A-61
End mills; special cutting tools.

Weltronic Corp., Detroit C-30
Welding machine controls.

Wesson Co., Detroit B-14
Cutting tools.

Westinghouse Electric & Mfg. Co., East Pittsburgh A-44
Welding equipment; motors; gearmotors; controls.

Westlof Tool & Die Co., Detroit C-38-A
Motorizing unit for machine tools.

Wetmore Reamer Co., Milwaukee A-93
Machine reamers; boring bars; special tools.

Whitney Metal Tool Co., Rockford, Ill. B-6
Tools; bending brake; rolling machine.

Willey's Carbide Tool Co., Detroit C-9A
Tungsten carbide tipped tools.

J. H. Williams Co., Buffalo B-64
Lathe tools; wrenches.

Wilson Mechanical Instrument Co., New York B-30
Hardness testing equipment.

J. Zagora Machine & Gear Co., Charlotte, N. C. C-4
Stationary light support.

Carl Zeiss Inc., New York C-99
Mechanical and optical instruments.

Wm. M. Ziegler Tool Co., Detroit C-1
Floating tool holders.

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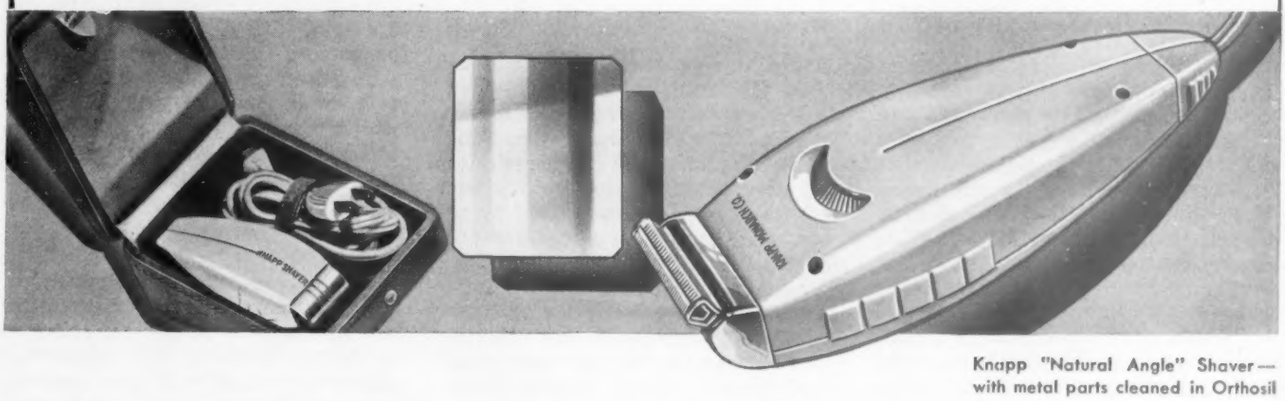

Knapp "Natural Angle" Shaver—
with metal parts cleaned in Orthosil

PENNSYLVANIA SALT
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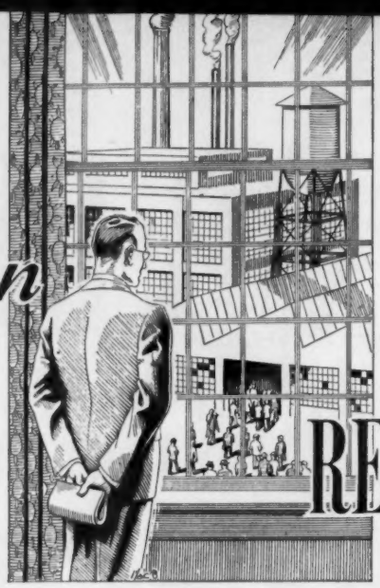
Chemicals

Forum on RE-EMPLOYMENT



■ FACTS and figures set forth in this week's Forum contribution give a clear idea of the recent and existing state of affairs in the capital goods industries, as well as of the great potentialities of these industries toward recovery and re-employment—if and when they are given certain definite opportunities and incentives.

Nelson W. Pickering, author of this article, is president of the Farrel-Birmingham Co. Inc., Ansonia, Conn., and Buffalo. An Annapolis graduate in 1908, Mr. Pickering had a distinguished career in the United States navy prior to joining, in 1919, what was then the Farrel Foundry & Machine Co. He is widely known, not only as the head of a large and important company in the field of capital goods, but also as one of the most constructive champions for the heavy industries in general.

As immediate steps toward sustained recovery and employment, Mr. Pickering advocates: Cessation of government competition with private enterprise; renunciation of regulative taxation; stimulation—rather than restriction—of private investment, enterprise and productive effort; a changed deficit financing policy; and encouragement of class co-operation, rather than class cleavage.

—*The Editors*

■ LONG TERM business recovery cannot take place without recovery of the durable goods industries and their resumption of a normal rate of growth. It is estimated that failure of the durable goods industries to recover has resulted in a payroll loss from 1933 to 1938 of nearly $10,000,000,000 and in the "unemployment" of 1,660,000 wage earners.

Observers are generally in accord that the foremost problem for 1939 is to effect transition from a pump-priming recovery to a true, long-term business recovery which, of course, means a healthy expansion in employment. The attempt to buy recovery through the John Maynard Keyes theory of government spending is now visible as a strategical blunder of the first magnitude, marked in execution by a series of tactical errors whose outcome has been distinctly unfortunate.

These results are now measurable in a quantitative sense by examination of the long-term decline in durable goods industries, especially iron and steel, nonferrous metals, transportation equipment and other producers of heavy goods. They are presented with a view toward giving point to the fact that the current revision of federal policy must include elements which will stimulate a natural revival of the durable goods division of manufacturing.

It has yet to be appreciated that government spending is possible only to the extent of available capital and credit. It is not yet fully understood that government spending is merely diversion of funds from one channel to another, not a creation of new funds. Hence insufficient emphasis is placed on the truism that blunders in selection of channels of spending work serious evils.

This point is of unusual significance to labor and to management. Both have been asked to believe that government spending represents net addition to income, when in fact it represents a deduction from one group—heavy industry—and probably a deduction from the economy as a whole. Data prepared by the census of manufactures shows the extent to which industrial income, employment opportunity and the purchasing power of wage-earners have suffered from the absence of normal recovery in the durable goods division of manufacturing industries.

In 1923 and 1929 the relative shares of the durable and light goods divisions of manufacturing were fairly constant. That constancy accounts in substantial measure for the stability of that period. In 1923, the eight durable goods industries, namely: Forest products; iron and steel; machinery; nonferrous metals; railroad repair shops; transportation equipment; stone, clay and glass products and miscellaneous industries; accounted for 53.13 per cent of total manufacturing income, as measured by the value added.

Eight groups of light industries: Foods; chemicals; leather products; paper products; petroleum and coal products; printing and publishing; rubber products and textiles; accounted for 46.87 per cent of total income. In 1929 respective percentages were 53.41 and 46.59 for heavy and light industries.

The subsequent depression of course diminished the share of the heavy goods groups. However, the natural and heretofore invariable accompaniment of business revival

has been a resumption by the durable goods division of its normal percentage of total income. The recovery year of 1935, for which complete figures are available, witnessed no such movement.

In 1935 the durable goods groups combined received only 45.37 per cent of the total manufacturing income, whereas the share of the light goods division climbed to 54.63 per cent, a marked contrast with the 46.87 per cent of 1923.

Had the light goods division represented—not 54.63 per cent of total manufacturing income in 1935, but the more normal 46 per cent—it would have required that the durable goods industries receive upwards of $3,500,000,000 more gross income than they actually did receive.

Put another way, total values added in manufacturing should have been $24,300,000,000 in 1935 instead of the $20,830,000,000 actually shown, and presumably would have been had the durable goods division recovered in the normal way. The loss is traceable in substantial part to the diversion of capital and credit from customary economic channels to those of unproductive nature.

Income Loss Serious

It is difficult to appraise the full effect of that loss of income to raw material producers, stockholders and to the construction, distribution and transportation industries. It must necessarily have been serious. We can however measure with some definiteness the effect upon employment opportunity and the payrolls of labor in the heavy industry division of manufacturing. In that way we can give point to the benefits which might accrue from a substantial revival of the durable goods industry.

For all economic purposes, the values added to raw materials by manufacture represent the only lasting source of industrial income. Out of that gross income is paid the total compensation of labor in a rather constant proportion. Hence any shrinkage in gross income is instantly reflected in a shrinkage of payrolls.

In different language, a diversion of income from heavy and durable goods industries to unproductive activities is followed by a diversion of income away from employes of those industries. The figures show significant changes.

In 1923, employes of durable goods industries received 60.41 per cent of total manufacturing income; light industries 39.59 per cent. In 1929, the respective figures were 59.48 and 40.52 per cent. In the recovery year of 1935 however, the natural rebound of the durable goods industries was absent, the percentage being 50.68 compared with 49.32 per cent for the light industry division.

The failure of payrolls of heavy industry to recover translates itself into dollars to the extent of some $1,800,000,000. In other words, had that division of industry revived in pace with the light division, total manufacturing payrolls in 1935 might well have been $9,340,000,000 instead of the $7,540,000,000 actually disbursed.

The difference in the two figures is representative of the payroll shrinkage suffered by employes of the eight durable goods industries under discussion. This figure of $1,800,000,000 is the estimated loss for a single year. What the loss might total for the five years from 1933 to 1938 can only be guessed, but it probably was not far short of $10,000,000,000.

Nelson W. Pickering
President
Farrel-Birmingham Co. Inc.
Ansonia, Conn.

It is logical to expect that a shrinkage of industrial income and its total payroll fund will be reflected in a decline in employment opportunity. The census figures provide a means of measuring the amount of unemployment arising from this failure of the heavy or durable goods division of manufacturing to attain its normal relationship to the light industry group.

It is shown that the durable goods industries provided 56.79 per cent of total manufacturing employment in 1923 and the light division 43.21 per cent. The figures for 1929 were 55.43 and 44.57 per cent. In 1935, employment opportunity in the durable division was only 47.90 per cent, while the light industry division accounted for the remarkable total of 52.10 per cent.

This disruption of the normal balance between the two broad divisions of manufacturing undoubtedly contributed substantially to the persistence of large-scale unemployment so baffling to the administration in Washington and so embarrassing to the proponents of the Keynes theory of spending.

Had employment opportunity in the durable goods branch of manufacturing kept pace and absorbed its normal proportion of total workers in 1935, it seems likely that total employment in that year would have been upwards of 9,000,000 wage earners instead of the 7,340,000 actually on the payrolls.

Some authorities feel that two to four men are required in raw material production, transportation, distribution and construction for every man employed in manufacturing. To the degree which those estimates are accurate, it may be reasoned that the absence from heavy goods production of approximately 1,660,000 accounts for the lack of jobs for 3,000,000 to 6,000,000 elsewhere in the economy.

It is possibly justifiable to say that whatever the real effect may be outside of manufacturing, the failure of government to encourage a resumption of durable goods activity undoubtedly accounts for a substantial part of all unemployment and the resultant relief burden. In the face of expanding population and a growing labor supply, this failure ranks perhaps as the major economic blunder of the new deal social regulation and experiment.

While undue emphasis should not be placed upon the absolute accuracy of these data, the figures nevertheless give point to the contention that federal policy changes must be such as to encourage revival of the durable goods division of manufacturing industry. With all due allowance for statistical limitation, the estimate of the loss of manufacturing income, purchasing power of wage-earners and job opportunity for a single year of the past five validates in every way the pressing need for a return to the natural processes of recovery.

Long Term Decline

For all practical purposes, the durable goods division has been in a long term decline, dating certainly from 1929. Any economic policy which does not embrace that fact can have no sound strategical basis and any changes in federal policy toward business which do not recognize that fact can have little hope of promoting an enduring recovery. Experience of these past six years surely should convince us that now is the time to get rid of the idea that the federal government should *do* something. Now is the time to cultivate the idea that the best thing

(*Please turn to Page* 72)

Recommendations for Working Stainless

Best practice in rolling molded sections, forging, annealing and pickling stainless steel is detailed here with a discussion of best methods for cleaning after fabrication and erection

■ IN THE rolling of molding sections, the selection of steels for the dies or forming rolls varies according to requirements and shop practice. Thorough hardening alloy or tool steels are used by some, although the majority of manufacturers use a case hardening type of steel, SAE 1020 or a low carbon alloy, which is turned to the required form and hardened.

Caution must be observed in roll design to eliminate the use of a sharp edge roll. A slight radius is of great assistance, but if possible a radius at least equal to the thickness of the material should be used.

In all cases the surface of the rolls should be burnished to a high finish, especially the portion of the roll subject to friction with the material. In repolishing rolls which have become abraded or loaded while in operation on the machine, use the finest grade emery cloth obtainable and always apply oil or grease. Dry grit applied on the surface will only give the metal a greater opportunity again to adhere.

If the design of the molding is such that it will be subject to considerable side friction, an insert of hard alloyed bronze or a full section roll of bronze at this station will assist greatly. The extra cost involved is counteracted by the saving effected in grinding and polishing time on the molding section.

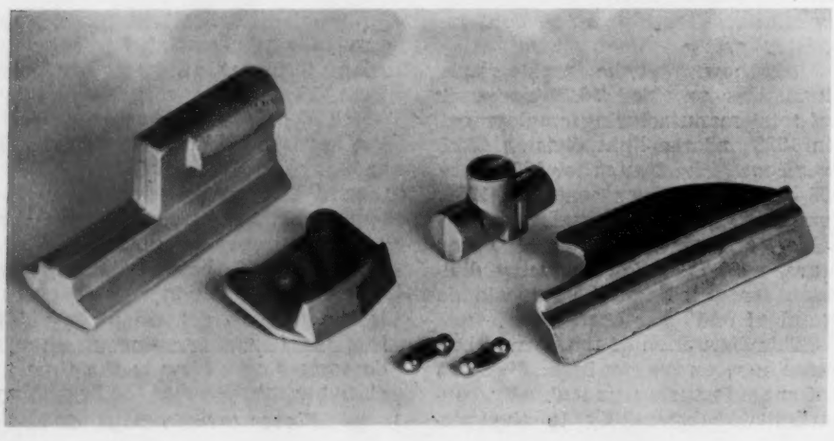
Roller guides are preferred to those of the stationary or friction type and will have less tendency to burr or work harden the edges of the material.

Lubrication of the surface of the material while passing through the machine is most important. Neglect usually results in abrasion of the surface and increased finishing costs. The lubrication can be applied by a wiper at the entry end of the machine, or by a liquid piped to each stand and flooded on the roll. If wiped on the metal surface, the film strength or adhesion properties should be of such consistency to carry through. The same types of lubricants recommended for drawing can be applied on roll forming operations.

Forging chromium-nickel steels of the 18-8 variety necessitates certain precautions not required to the same degree in forging straight carbon or low alloy steels.

Heating should be done with considerable care. Furnace should be clean of slag and fed with the prop-

This material is condensed from a booklet, "The Fabrication of Republic Enduro Stainless Steel," soon to be published by Republic Steel Corp., Cleveland.



Small parts such as these are easily forged from stainless steel

er mixture of gas and air, or oil, as the case may be. It should be of ample length to permit placing the parts being heated well back in the furnace. It is extremely hard to heat parts uniformly if a portion requiring forging is too near the door opening.

The heating should be slowed up to 150 or 1600 degrees Fahr. followed by thorough soaking at this point, then brought up rapidly to a forging temperature as near 2150 degrees as possible. Temperature should not be over 2200 degrees as ruptures may occur if the temperature is on the high side. It is well to give the first few blows rather lightly. When metal starts to flow, quicker deformation of the metal is safe. Little work should be done at a temperature of 1850 degrees, and 1800 degrees Fahr. should be the low limit.

Reheating Not Detrimental

In some cases it may be necessary to replace the forging in the furnace several times to keep the heat at the desired point. This is not detrimental to steel of this grade unless it is allowed to soak at high temperature, under which condition it is subject to quite injurious grain growth.

On bars of 1 inch and less, it is quite practical to heat in a single furnace, but it is advisable to use two furnaces for larger material. One should he held at 1600 degrees for preheating; the other at the high temperature. Bars should be transferred from the low temperature furnace to the high and held only long enough to heat thoroughly. The high temperature furnace should be controlled automatically to assure even temperature of forging stock.

Time required for heating bars for forging is approximately that necessary for carbon steel and the amount of blows upward of 25 per cent greater for a given amount of working. Surface finish of bars must be good as seams, laps, etc. will not heal up in the forging operation and will cause loss of finished parts.

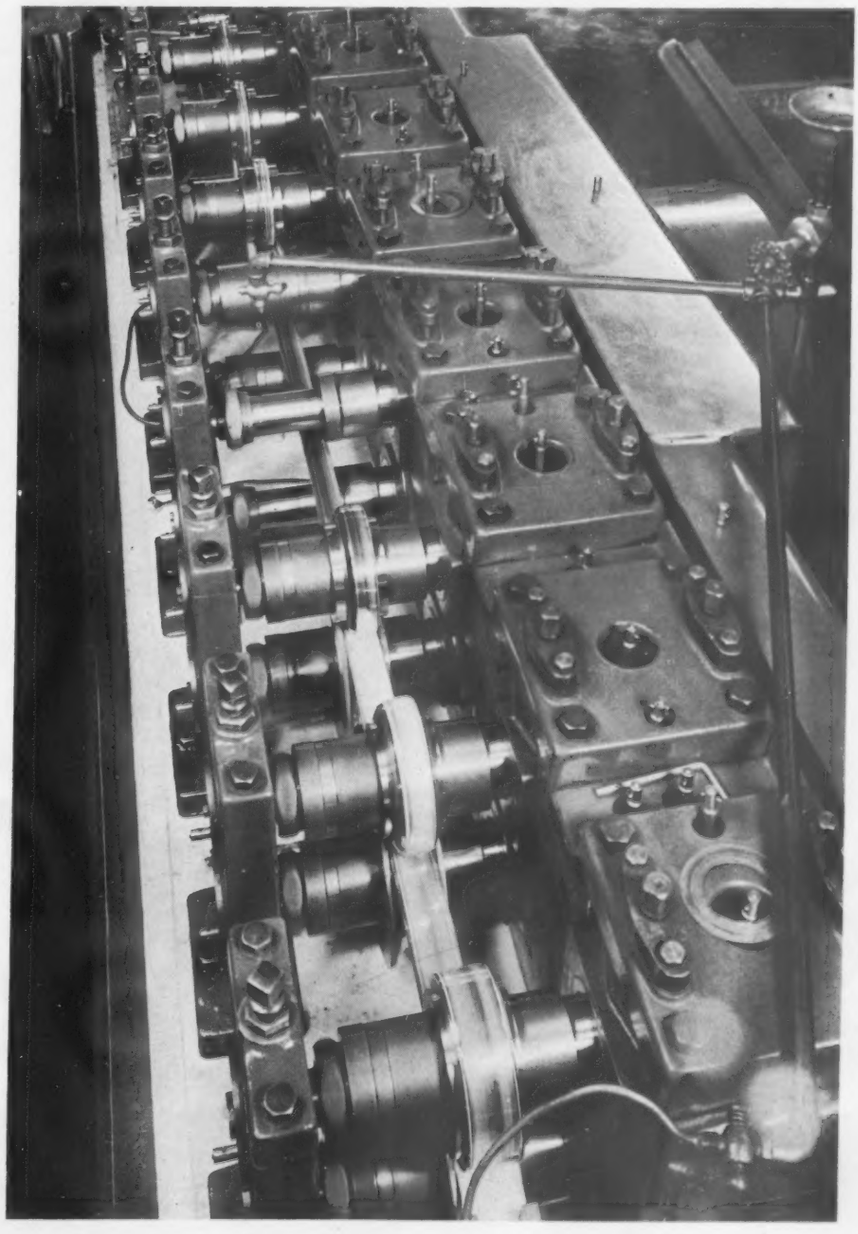
Dies for forging in which it is necessary to gather stock in breakdown should be constructed so flow of metal will be outward. There must be no fold-in at the corners or junctions as this will cause laps which cannot be worked out. Dies should be designed to make the least possible amount of flash. This not only will prevent waste of material but also will save reheating a cool flash which will not give under the hammer.

Sometimes it has been found advisable to trim the flash during forging especially if a light hammer is used and a number of blows is necessary to finish forgings. Forgings should be hot trimmed and restruck if possible. If it is necessary to allow forgings to cool, it may be advisable to reheat before shearing the flash to avoid any rupture at flash line.

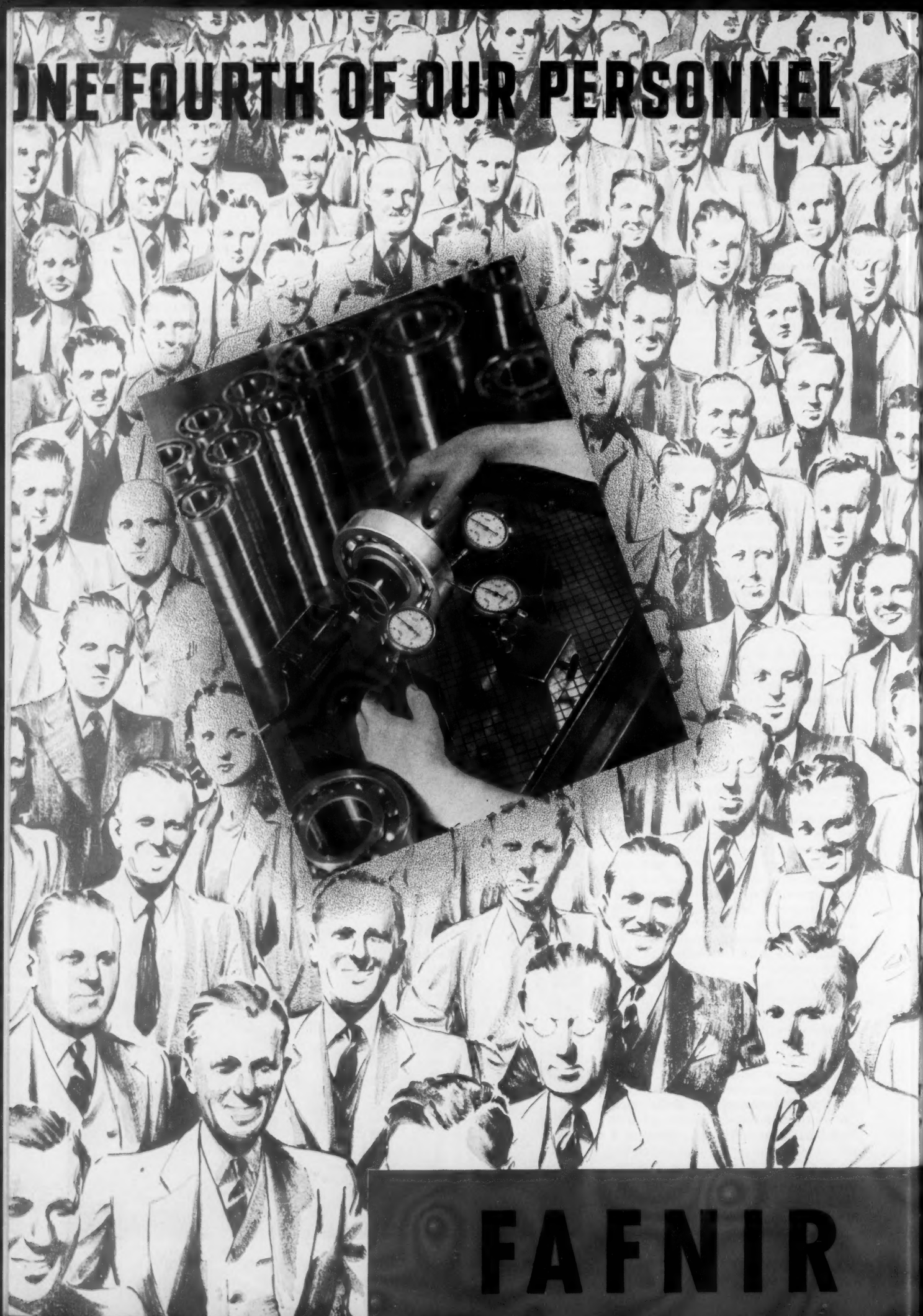
When making small drop forgings of this grade of steel, they can be dropped into water when they come from the die. This helps to break up scale and simplifies pickling. Pickling solutions should be followed by a passivating dip consisting of 15 to 25 per cent solution of nitric acid and water at 130 degrees Fahr. Forgings then should be washed in water if they are to be used without first being machined.

For forging the straight chromium steels, the above applies in general except that forging temperatures differ somewhat. The heat range for drop forgings should be 1900 to 2000 degrees Fahr. When working the higher grades approaching the cutlery type, the temperature should be lowered to about that of tool steel requirements, 1750 degrees Fahr. being considered the lowest range for practical use. Above temperatures were selected from observation on practical operations and are given as a guide. To meet some peculiar condition it may be necessary to depart from these values.

While many operators say general design of dies and draft need not vary from that used on carbon steel, it is important that this be no less than used for other grades of



View of rolling machine showing successive steps in forming molding strip. Material first passes through a lubricating well before entering rolls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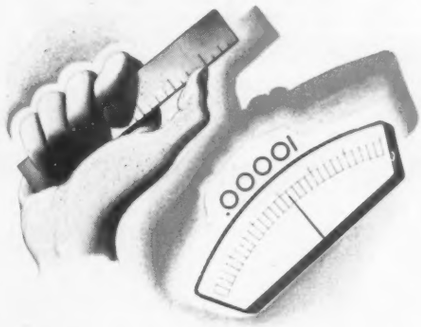

Much of Fafnir's inspection is on a plane of high precision far beyond the scope of human eyes and hands. So Fafnir has adapted laboratory-accurate methods to routine work, utilizing the "eyes" and "hands" of electricity, of magnetism, of instruments that "feel" hundred thousandths as your fingers feel inches. Thus, the possibility of human error is virtually eliminated.

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steel. Otherwise the forging will have a tendency to stick in the die, thus cooling the work and more particularly the light flash, making it necessary to reheat before resuming the operation. With care, satisfactory forgings can be produced regularly from these grades of steel.

Annealing and pickling of stainless steel may be divided into two groups. The first group, the chromium type steels, is annealed at a lower temperature than the second group, and rate of cooling must be retarded to obtain maximum amount of softness. The second group, the austenitic or chromium-nickel steels, is heated to a much higher temperature than the first group and cooled rapidly, either in air or by water quenching. Rapid cooling prevents carbide precipitation and insures a complete austenitic structure.

Annealing Recommendations

To obtain a full anneal with maximum softness, 4 to 6 per cent chromium steels should be heated to 1525 to 1550 degrees Fahr. and cooled slowly to 1100 degrees Fahr. A softening treatment that may be employed on this grade is heating to 1350 to 1400 degrees Fahr. and cooling in air.

The 10 to 14 per cent chromium steels can be fully annealed for maximum softness by heating to 1500 degrees Fahr., followed by a furnace cool to 1100 degrees Fahr. This group may be softened by heating to 1300 to 1400 degrees and air cooling.

The 14 to 18 per cent and the 23 to 30 per cent chromium ranges may be annealed by air cooling from 1400 to 1500 degrees Fahr. for the former type and 1450 to 1550 degrees Fahr. for the latter. The 14 to 18 per cent chromium steels should be furnace cooled from 1400 to 1500 degrees down to 1100 degrees and then air cooled to attain maximum softness. Remember that austenitic steels, the second group, must always be cooled as rapidly as possible.

Standard 18-8 stainless and modifications thereof should be heated around 1900 to 2050 degrees Fahr. and cooled rapidly either in air or by water quenching. This treatment is also applicable to the austenitic chromium-nickel steels containing additions of molybdenum, columbium, silicon and titanium.

Chromium range of 22 to 26 per cent, with nickel ranges of 12 to 14 per cent and 19 to 21 per cent respectively, are annealed by rapidly cooling from 2000 to 2100 degrees Fahr.

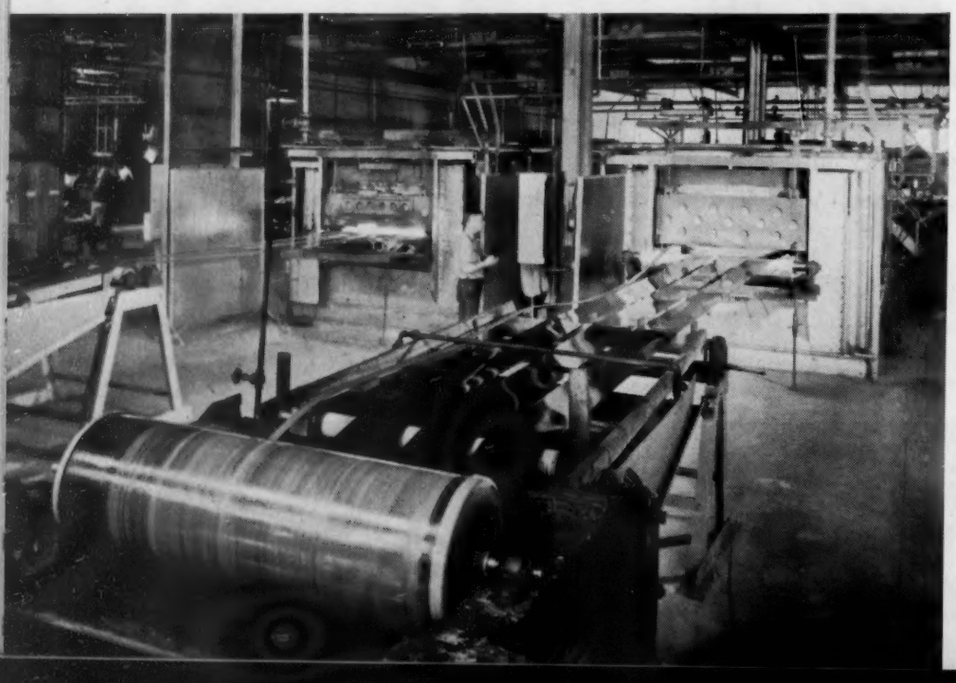
Material being annealed should always be given sufficient time at temperature to insure uniform heating throughout and complete transformation of its crystalline structure. The atmosphere of the annealing furnace should be neutral to obtain a scale that can be pickled readily.

Pickling solutions used with stainless steels are slightly different from those used for mild steel due to the character of the scale and its resistance to attack by certain acids. However, the 4 to 6 per cent chromium steels may be pickled in the same solution as mild steel, namely, a bath of 5 to 10 per cent sulphuric acid at 150 to 170 degrees Fahr, or a mixture of sulphuric and muriatic acids at the same temperature. The use of an inhibitor is recommended, as pitting is likely to occur if only a plain acid is present.

Chromium and chromium-nickel stainless steels may be pickled in a 25 to 50 per cent muriatic acid solution at 120 to 130 degrees Fahr. Also an 8 to 10 per cent sulphuric acid solution at about 130 to 160 degrees Fahr. can be used. Another mixture, 6 to 8 per cent sulphuric with 6 to 8 per cent muriatic at 130 to 140 degrees also may be used. After pickling, the material should be rinsed thoroughly, dipped in a warm solution of 25 per cent nitric acid and washed in water.

A pickle of 10 per cent nitric acid, with 1½ per cent hydrofluoric acid at 120 to 130 degrees Fahr. following any of the preceding pickles, will produce a clean, white surface requiring little scrubbing.

Annealing furnaces and continuous electrolytic pickling of Enduro stainless steel cold-rolled strip at Central Alloy division, Republic Steel Corp., Massillon, O.



Cleaning Often Necessary

Cleaning after fabrication and erection is often necessary in many fabrication operations as a lubricant is frequently employed to avoid excessive scratching, especially where high finishes are concerned. Under such conditions, and even when dry forming is involved, the accumulated surface deposit must be removed before the equipment is shipped.

If the lubricant or deposit has a grease base, it is best to wash first with a good solvent such as kerosene, gasoline, naphtha, etc. Then wipe dry. While removing all of the grease, it leaves a thin oily surface film which can be removed by absorbing with finely bolted whiting. The whiting, or precipitated calcium carbonate, should be sifted on the surface and wiped off with a soft cloth, such as flannel. This will bring out the true color and luster of the metal.

Material used for buildings, either interior or exterior trim, may become polluted by cement, dust, paint, lacquer, etc., during construction. Heavy kraft paper applied with ordinary paperhanger paste will afford protection. It can be washed off with warm water when desired. If not thus protected, the surface should first be washed with benzene, benzol, turpentine, paint remover, etc., depending on the deposit in question.

Never use steel wool, metal scraper or any other mechanical method, as scratching and contamination of the surface are almost certain to result. Steel or iron particles may thus become imbedded in the surface and at a later date oxidize to brown iron rust, making it appear as though the stainless were discoloring, when the stainless actually is not affected in any way.

Follow this preliminary cleaning with a final washing, using half-and-half powdered 00 pumice and whiting on a soft rag, wet with either plain water or water to which a little ammonia has been added. Always rub in the direction of the

(*Please turn to Page* 81)

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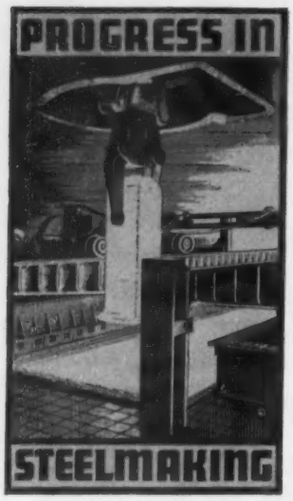

Revolving-Top Control

New system eliminates control equipment at top of blast furnaces thereby permitting all control to be housed below where it is accessible. Eliminates previous hazards to men when inspecting or working on control at top of furnace

■ OPERATION of blast furnaces involves so many variables that it is extremely important to eliminate as many of them as possible. Thus, one of the first essentials in charging the furnace is to obtain uniform distribution of material and to avoid segregating the large pieces from the fines.

The almost universal method of charging blast furnaces involves the use of the McKee revolving distributor. As the skip hoist reaches the top of its travel, it discharges onto a small bell on the top of the furnace shown in Fig. 1 at A. There is a tendency for the coarser material to leave the skip car first and for the fine material to hang back, resulting in a serious error in the distribution of coarse and fines as the material lies on the small bell. When the small bell is opened this material falls onto the large bell at B, where this same error in distribution would occur unless some means were taken to correct it.

It is essential that this error be corrected or the radial distribution of material in the furnace itself would be such as to cause most unsatisfactory operation. The operation of the McKee revolving distributor may be described as follows:

The furnace is equipped with a large stationary hopper mounted directly above the revolving hopper, the bottom of which is closed by the small bell. The purpose of the stationary or receiving hopper is to properly guide the material from the lip of the skip car into the revolving hopper. The material falls from the receiving hopper into the revolving hopper shown at A in the accompanying diagram. At bottom of this revolving hopper is the small bell which is normally closed. Both small bell and revolving hopper are arranged so they can be rotated. Below the small bell is the large bell with its hopper, shown at B in the diagram, Fig. 1. This bell also is normally closed. Material discharged from the large bell and hopper goes directly into the top of the blast furnace.

By revolving the small bell and hopper at A it is possible to distribute the unavoidable error which occurs when material is dumped out of the skip car onto the small bell.

Procedure during charging is as follows: Assuming a 6-skip round containing ore, coke and limestone, the distributor being arranged to place each round at an increment of 60 degrees from the previous round, the distributor control is set on the zero position and the first six skip loads are successively placed on the large bell through the small bell without being rotated. The large bell is then opened putting the first round into the furnace. For the next round of six skips, each skip load, after being placed on the small bell, is rotated through an angle of 60 degrees so the error of distribution in

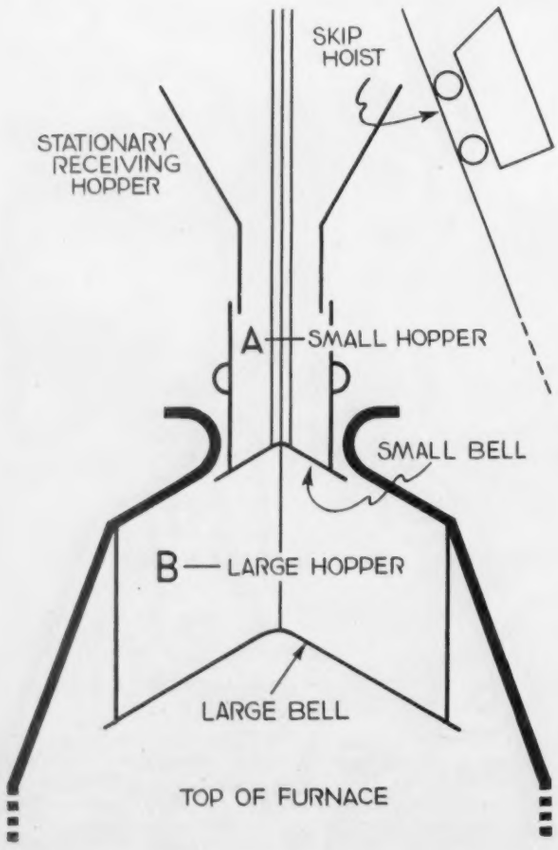

Fig. 1—Rough diagram of elements involved in McKee revolving distributor for blast furnace charging service

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STEEL CASTINGS

coarse and fines referred to above now lies across an axis 60 degrees away from that which occurred in the previous round. The large bell is then dumped, placing the second round in the furnace.

On the third round, each of the successive six skip loads is rotated 120 degrees before being placed on the bell. The next round is similarly rotated 180 degrees, the next 240 degrees, the next 300 degrees, etc., whereas the last round of the cycle, instead of being rotated 360 degrees, is put through on the zero position.

Error Radially Distributed

The result of the revolving method of charging can best be visualized if it can be imagined that instead of revolving the small bell and its hopper for each skip load as described above, each round was placed upon the large bell and before dumping the large bell the entire blast furnace below the bell was rotated through angles of 60 degrees, 120 degrees, 240 degrees, etc. Thus the unavoidable error occurring when the skip is dumped, is radially distributed throughout the furnace, of utmost importance to secure proper furnace operation.

Entire small bell and its hopper rotate as a unit, being driven by an electric motor and suitable gearing. Control for the distributor includes contact switches which make a contact every 60 degrees of rotation. The control is also selective inasmuch as any number of skips per round can be charged. In other words, the angle of rotation can take place after any predetermined number of skip loads. The usual arrangement of control is to have a limit switch connected through gearing to the main drive and making a contact every 60 degrees of rotation, thus actuating the selector and motor switches in the control house below.

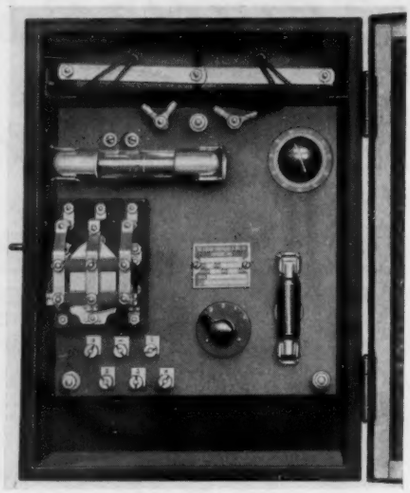


Fig. 2—New time control unit for distributor top service using Neo-Time relay. Photo courtesy Electric Controller & Mfg. Co., Cleveland

Some means has long been sought to do away with every possible electrical or mechanical device on top of the furnace which could be replaced with an arrangement doing similar duty but located in the control house below. For this reason, for instance, it has been for some years the practice to use dynamic braking on the motor rather than the formerly conventional shoe-type magnetic brake. Recently one plant successfully worked out a scheme which entirely eliminates the use of the limit switch controlling the rotation of the top and which was formerly located in connection with the drive gearing at the top of the furnace. The heart of the new system, all of which is housed in the control house below, is a new type of time relay which is employed to control accurately the length of time that power is applied to the motor driving the furnace top.

Rotation Angle Selected

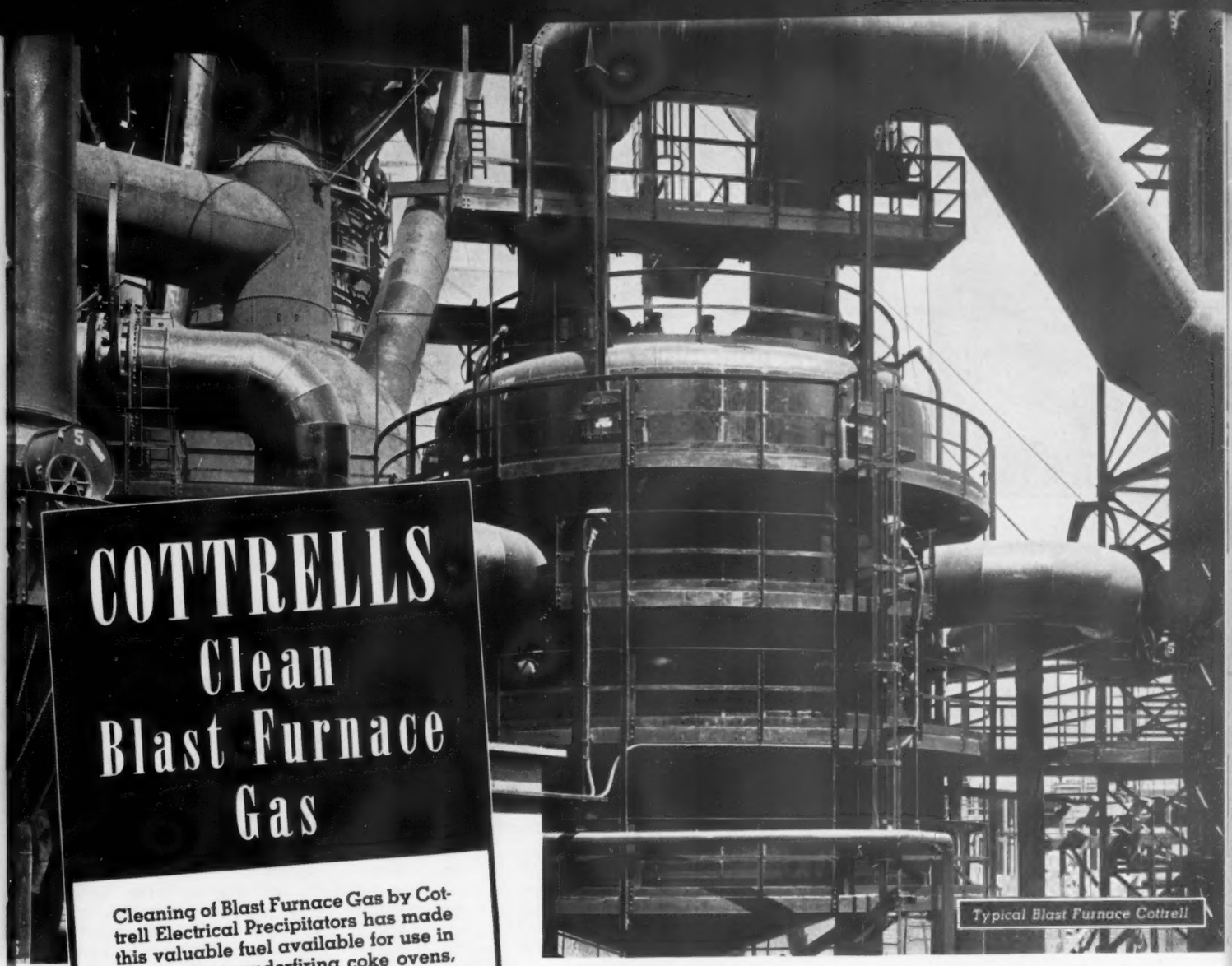
With a constant speed motor it is possible to revolve the top through any desired angle of rotation by selecting the proper length of time that power is applied to the driving motor. In the instance stated above, the relay is carefully set and calibrated to revolve the top at 60 degree increments. When multiples of 60 degrees are desired the selector switch automatically reconnects the relay at the end of each 60 degree movement until the entire total movement has been accomplished.

The system described here has been made possible by the development of an extremely accurate time relay which can be adjusted to operate at any interval from a fraction of a second up to 20 or 30 minutes. Developed by Electric Controller & Mfg. Co., Cleveland, the relay uses a new, especially rugged, neon type tube in a simple, condenser charge, neon tube discharge, control circuit. The new unit operates directly from the source of power and is not dependent upon mechanical adjustments or any elements affected by temperature or atmospheric changes. The relay automatically compensates for voltage changes to correct for any change in motor speed due to voltage variations.

Where this equipment has been installed, the blast furnace operators are so enthusiastic over its operation and the elimination of the hazard formerly connected with the maintenance of the hopper switch at the furnace top that this system is rapidly being installed on all the blast furnaces at the plant.

Flies 2785 Miles at Cost of $25.70

■ **When Johnny Jones stepped from his Aeronca "Chief" at Roosevelt Field, N. Y., Nov. 30, 1938, he had made the first nonstop transcontinental flight in an 800-pound 2-seater machine. Time was 30 hours, 47 minutes, an average speed of 91 miles per hour. Total cost of fuel and oil was $25.70. Plane has wing span of 36 feet, is 22 feet long, was built by Aeronautical Corp. of America at Cincinnati, has a 50-horsepower Continental engine with crankshaft, rocker arms, gears, etc., of nickel alloy steel. Cylinder heads are aluminum-nickel alloy, connecting rod and crankshaft bearings a cadmium-nickel alloy. Photo courtesy International Nickel Co. Inc., New York**



Typical Blast Furnace Cottrell

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Continuous Strip Annealing

A controlled atmosphere, continuous annealing furnace produces remarkable physical characteristics and finished appearance on strip up to 30 inches at rate of 2000 pounds per hour. Uses automatic 3-zone heating and two cooling stages

By W. F. ROSS
Furnace Engineer
The Electric Furnace Co.
Salem, Ohio

■ THE MANY improvements in stamping technique and advent of comparatively broad widths of strip steel of greatly improved surface and uniform gage within the last decade have made possible efficient, low cost production of an infinite variety of formed metal parts.

Consequent increase in the quantities of strip steel demanded per year by industry have resulted in the scientific design of new production equipment. Special atmosphere, continuous, strip normalizing furnaces, which give the metal the uniform physical characteristics so necessary for forming, constitute a particularly interesting development.

Recent installations include important developments in redesign and practice. An outstanding modern installation is used by a well known manufacturer of cold rolled strip. Here special atmosphere, continuous normalizing equipment is producing satisfactory work of remarkable physical characteristics and finish appearance.

This equipment consists of an electrically heated chamber, a relatively long continuous cooling chamber, and a spray cooling section adjacent to the discharge end. Reeling and unreeling equipment is provided at the ends of the furnace to facilitate handling of coils. Designed for continuous parallel strands of strip 6 inches wide, the equipment also may be used for a single strip up to 30 inches in width, or any number of narrower parallel strips within the clearance dimensions of 30 inches.

In operation, strip is passed continuously from unreeling apparatus into the furnace through an entrance vestibule at the charging end of the furnace chamber. Strip goes through the atmosphere filled heating and cooling chambers on a roller hearth conveyor whose individual rolls are spaced on 2-foot centers. After a relatively short time in the heating chamber, the continuous strip passes through a water coil type cooling chamber which gradually and uniformly lowers the temperature of the material as the strip progresses into a short spray chamber adjacent to the discharge end of the cooling hood.

Here the stock is sprayed with water at a temperature of about 190 degrees Fahr., quickly bringing strip temperature near 200 degrees Fahr. This temperature is sufficiently low to prevent discoloration of the work when it passes into the outer air. However it permits enough residual heat to be retained within the stock to insure the strip being dry and bright when it emerges from the furnace equipment.

Clean, scale free work is made possible by designing the furnace equipment to be substantially gastight and then by purging the furnace of air, using the nonoxidizing products of combustion formed in a separate gas cracker or generator.

A drive, consisting of motor, vari-

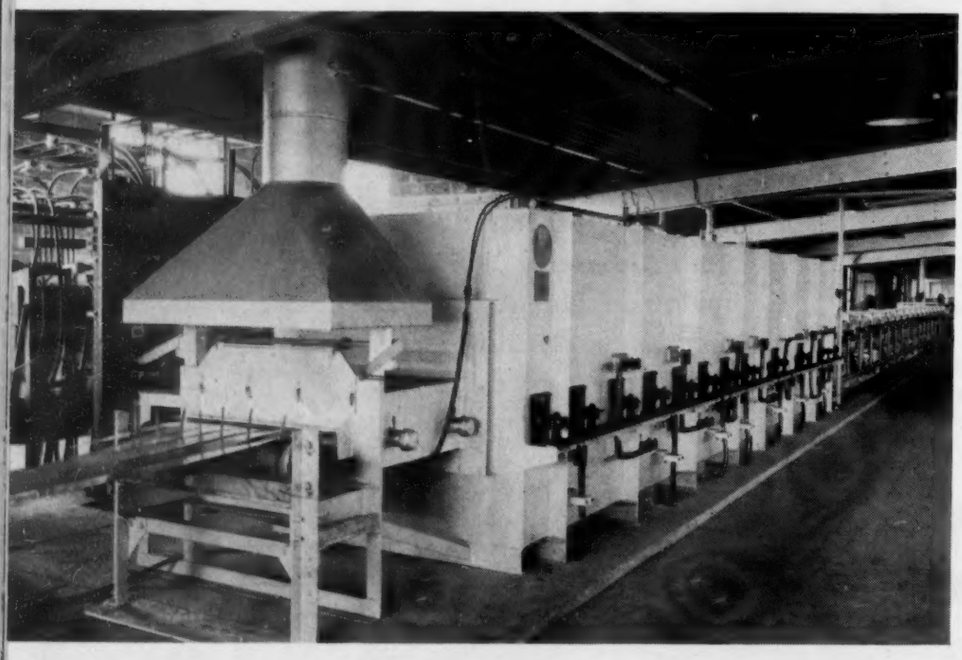


Fig. 1—Charging end of a controlled atmosphere furnace which bright anneals cold rolled strip continuously. This unit handles widths up to 30 inches. Wider widths are handled in similar furnaces

Advertisement

COPPER ALLOY BULLETIN

Reporting News and Technical Developments of Copper and Copper-Base Alloys

MARCH — "Bridgeport" Brass Co. — 1939

CORRECT METHOD IMPORTANT IN ROCKWELL HARDNESS TESTS

One of the simplest and most common tests in use for checking and controlling temper in the production of a high quality, uniform brass mill product is the Rockwell hardness test. In common with most hardness tests it does not give values which can be used in design formulas. It does, however, give reproducible values which are comparable and enables the test and control departments to classify the temper of copper and its alloys if suitable standards are developed.

The Rockwell test operates by direct measurement of the depth of an impression produced by pressing a ball of standard size under a fixed dead weight load. Another feature of this test is the ability to make tests under several loads and types of penetrator. This permits the application of the test to various types of products. For light gauge materials a Superficial Rockwell test which uses a series of lower loads is used. While there is no accurately fixed gauge limitation between the Superficial and Standard Rockwell tester the American Society for Testing Materials has adopted tentatively in the specification for sheet brasses (B36-38T) the following limitations:

Annealed sheet brass, .020" and heavier — 60Kg load and 1/16" ball F

Annealed sheet brass, .015" and heavier — 30 Kg load and 1/16" ball (30T superficial)

Hard sheet brass, .020" and heavier — 100Kg load and 1/16" ball B

Hard sheet brass, .012" and heavier — 30Kg load and 1/16" ball (30T superficial)

The reason for these limitations lies in the fact that in tests of thinner sheet, an anvil effect is encountered which affects the normal relationship of hardness values. For similar reasons tests made on several thicknesses of sheet are not comparable with tests made on the same material of a thickness equal to the total thickness of the packed sheets.

As in all tests there are certain precautions which must be observed in order to obtain reproducible results. Attention is called to the Standard Methods of Rockwell testing adopted a number of years ago by the A. S. T. M. (E-18-36). One of the most important precautions to be observed is the proper contact between the sample, penetrator and anvil. This can usually be accomplished by the use of a small diameter anvil. Samples not perfectly flat should be tested with the concave side up, as shown in the adjoining column.

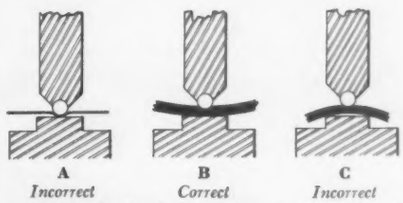
The methods of testing rod are not as well standardized as tests on sheet. It is obvious that tests on the convex surfaces of rods are not comparable to tests on flat smooth surfaces of sheet, and tests of this type will be affected greatly by the diameter of the rod. With large rod the effect is not so pronounced, but experience has shown that more consistent results are obtained by filing a flat surface about 1/8" to

(*Continued on Following Page, Column 2*)

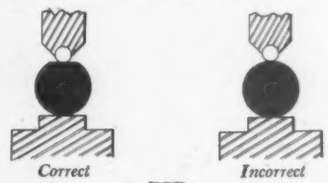
Announcement

It is our hope that the COPPER ALLOY BULLETIN will be useful to you as a permanent source of reference material on the subject of copper and copper alloys. Many of our readers, we know, file their copies of each issue so that they may easily refer to articles in past issues which have proved interesting and valuable. In order to increase the usefulness of the COPPER ALLOY BULLETIN in this respect, it has been suggested that we prepare a subject index.

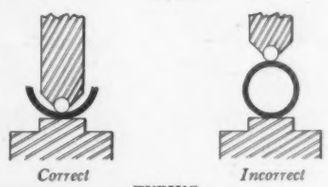
We are interested in knowing the reaction of our readers to this suggestion before proceeding with the preparation of such an index. Would an index increase the usefulness of the BULLETIN? If you believe that it would, will you write us your comments?



A. Note distortion in thin sheet. **B.** Note lack of distortion in thicker sample and good contact between penetrator, sample, and anvil. **C.** Note poor contact between sample and anvil.



ROD



TUBING

NEW TECHNICAL BULLETIN DESCRIBES DURONZE III

Bridgeport Brass Company has issued a comprehensive technical bulletin giving detailed information on the properties and uses of Duronze* III. This alloy has the remarkably high tensile strength of about 100,000 pounds per square inch on the smaller sizes when supplied in rod form and about 90,000 pounds per square inch when hot forged. Composed of 91% copper, 7% aluminum, and 2% silicon, it was developed by Bridgeport metallurgists, and is being widely used for the manufacture of many different shapes of parts requiring high tensile strength and unusual resistance to corrosion. Furnished in the form of rod or ingot, it is adapted for screw machine parts, forgings, and sand castings.

The new bulletin is intended to assist the fabricator by presenting, in convenient form, full information on the physical properties of Duronze III and on the methods by which it may be fabricated. Among the technical information included are data on tensile strength of various sizes of rod and of sand castings, annealing characteristics, and resistance to corrosive agents. Properties of Duronze III are compared in tabular form with those of copper.

In addition, the bulletin suggests typical applications for which Duronze III is exceptionally well suited. Among these are pole line hardware, wire and cable connectors, large* bolts and nuts, tie rods, oil burner nozzles, valve stems and parts, gear blanks, and compression fittings.

Copies of this helpful bulletin may be obtained by writing the Bridgeport Brass Company.

PREPARED EACH MONTH BY THE BRIDGEPORT BRASS COMPANY
Headquarters for Brass, Bronze and Copper

COPPER ALLOY BULLETIN

TYPES OF COPPER

This is the second of a series on the various types of copper, their relative merits and uses.

Tough Pitch versus Deoxidized Copper

The most important differences between *Tough Pitch* and *Deoxidized Copper* are those caused by the presence of the small quantities of oxygen found in *Tough Pitch.*

The presence of cuprous oxide affects the properties of the copper directly in two ways, and indirectly, to a lesser extent, in other ways. Tests and mill experience have shown that the ductility of copper containing oxygen is less than that of copper free of oxygen. This difference in ductility, however, is not of such a nature to prevent the use of Tough Pitch or oxygen-bearing copper for many purposes. It is, rather, that for the more severe cold working operations, Deoxidized Copper will perform more satisfactorily. In such operations as copper tube drawing or the manufacture of wrought tubular fittings and other complicated fabricated parts, considerable savings in annealing costs may be realized, and in some cases parts impossible to make of Tough Pitch Copper may be made by the use of Deoxidized Copper. In such work, however, it is necessary to determine what part electrical and thermal conductivity may play in the use of the article. Copper deoxidized with phosphorus may have appreciably lower conductivity than standard Tough Pitch Electrolytic, depending on the amount of phosphorus left in the copper after deoxidizing.

Effect on Annealing and Welding

The second direct effect of the oxide is in the annealing of Tough Pitch Copper under reducing conditions. In spot annealing, bright annealing, and welding Tough Pitch Copper, care must be used to prevent gassing the copper. The term gassing is applied to the embrittlement of such copper by the reducing action produced at high temperatures by hydrogen or carbon monoxide gas. These reducing gases act upon the cuprous oxide particles dispersed throughout the copper, reducing the oxide to copper and forming H_2O or CO_2 gas. The formation of these gases develops considerable pressure within the body of the metal, forming cracks and voids that make the copper brittle and unfit for further cold working. This gassing is very likely to occur at welds of Tough Pitch Copper and whenever the metal is spot annealed by open flame methods. It occurs in bright annealing only if the protective atmosphere is highly reducing and the temperature of the anneal is high. As in many chemical actions, several factors are involved; it is a combination of these factors—time, temperature, and quantity of reducing gas—that will cause failure. The use of fully deoxidized copper, containing no cuprous oxide, will prevent such failures.

This discussion of the relative properties of Tough Pitch and Deoxidized Copper will be concluded in the next issue.

Fabricators desiring information on the various types of copper or copper alloys in specific applications are invited to discuss their problems with Bridgeport Brass Company.

ROCKWELL HARDNESS TESTS

(Continued from Preceding Page, Column 2)

$\frac{5}{32}$" in width on the longitudinal surface of the rod. While this method may not always be indicative of the hardness of the rod over the entire cross-section it is most satisfactory as a means of control of uniformity of product. Rockwell tests are not generally used for rod or wire less than $\frac{3}{16}$" in diameter, although the use of the Superficial test may permit tests on smaller sections.

Tests on full size tubing are subject to the same difficulties as tests on unfiled rods. They are also subject to error because of the hollow core. In many cases the test load is great enough to cause permanent distortion of the tube cross-section. For this reason tests on tubing are made on the concave longitudinal surfaces of split samples. There are of course theoretical objections to tests made in this manner, and the smaller the tube diameter the more valid these objections become. It is obvious that tests can not be made on samples so small that the side of ball holder touches the sample. Experience has shown that tubes $\frac{1}{2}$" in diameter and .030" in wall thickness may be tested in this manner with consistent results. The wall thickness may be reduced to .020" if tests are made with the Superficial Rockwell.

It must be emphasized that tests on rod and tubing are not as exact as tests on sheet. For control purposes, however, tests made as suggested above may be used with considerable success.

Oxidation Resistance Of Copper Alloys

Studies of oxidation resistance of copper alloys have been reported in the *Journal of the Institute of Metals* (British). The authors show that an alloying constituent added to prevent oxidation at high temperatures should have high affinity for oxygen, and should, on heating, form an oxide film of high electrical resistance. The radii of the cations in the protective film should preferably be small.

These studies, based on theoretical considerations, explain the high resistance to oxidation of the alloys of aluminum with copper.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. Further information on any of these items may be obtained by writing the Bridgeport Brass Company, which will gladly refer readers to the manufacturer or other source.

A variable speed lathe is said to eliminate wrench adjustments. Scratch brushing, buffing, and polishing can be performed as desired, since the change from one speed to another requires but a fraction of a minute. Speed can be varied from 870 to 3,050 RPM by turning a hand wheel.

A high-intensity torch is reported to be suitable for general purpose soldering and brazing. It is supplied with carburetors for coal gas, natural gas, or mixtures of the two. Two tips are available: the smaller one for ordinary soldering and brazing operations, the larger for use where large quantities of alloy must be melted rapidly.

An improved spectrograph is provided with a cover which permits it to be used in a lighted room. It is also supplied with an optical bench of rigid construction, fitted with V groove to insure exact alignment of the rotating sector, lens holder, arc or sparkstand, and sector photometer. It is said that these improvements facilitate analysis by either the emission or absorption method.

Copper oxide rectifiers have been applied to heavy duty rectification for plating purposes in the electrotyping industry. It is reported that their use in place of motor-generator sets permits appreciable savings in power. Another reported advantage of the rectifiers is that they require little maintenance.

A new arc welder is reported to be suitable for light gage work. It is rated at 150 amperes, direct current. It is reported to have high instantaneous recovery of voltage and to prevent excessive current surges thus avoiding high spatter loss.

A flexible-shaft grinder is said to be adaptable to drilling and sawing operations as well. It includes a 1-16-horsepower motor, variable speed rheostat, 37-inch flexible shaft, and ball-bearing hand-piece with chuck.

A portable sander is reported to make available to the average workman the advantages of a belt sander. It is light in weight and can be used in any position. Power is said to be sufficient for all types of sanding. Unit is adaptable to straight or slightly curved surfaces. Front pulley may be used as a spindle sander.

A soldering flux is intended for use on difficult applications. It may be used on brass, copper, cadmium, and other metals. Low surface tension and good wetting power of the flux cause a quick, uniform flow of solder into crevices.

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BRIDGEPORT BRASS

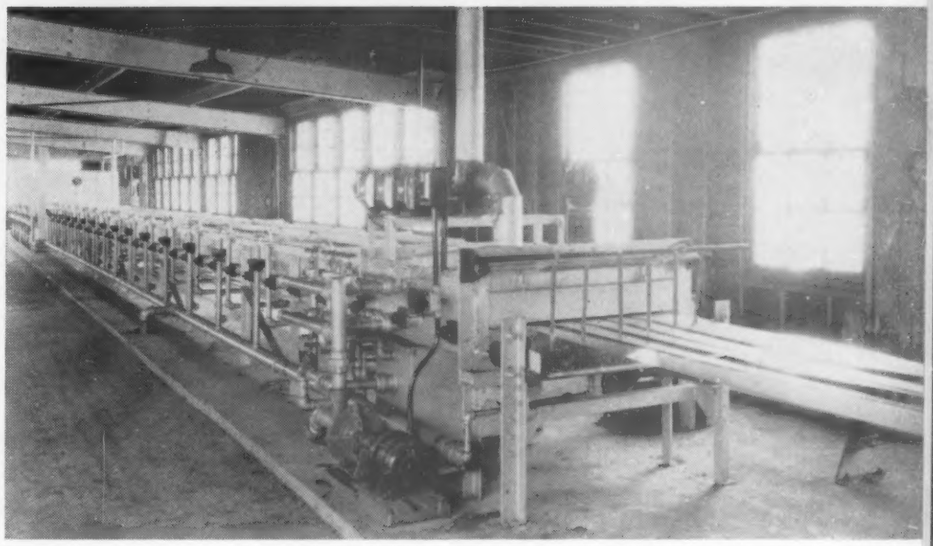


Fig. 2—Discharge end of furnace shown in Fig. 1. Here can be seen the water cooling chamber and the spray chamber. Strip emerges from the furnace uniformly annealed, bright and dry

able speed reduction, line shafting, etc., continuously rotates the rolls upon the hearth and throughout the various chambers of the equipment. It is arranged to provide quickly and easily the proper time and speed through the heating chamber for each type and thickness of strip normalized.

Although ordinarily used at temperatures near 1750 degrees Fahr., furnace chamber temperature may be varied according to the normalizing procedure most suited to the requirements of the various types of strip. Temperatures as high as 2000 degrees Fahr. may be used. Temperature control in the heating chamber is accomplished by thermocouples and pyrometers in three distinct zones. Electrical heating element in each zone is connected or disconnected from the power supply through relays and switching equipment connected with its respective pyrometers.

The installation described is rated at 275 kilowatts and was designed for the continuous production of 2000 pounds per hour of bright steel strip heated to 1750 degrees Fahr. It was designed and developed by Electric Furnace Co., Salem, O., builders of many specialized, controlled atmosphere, heat treating installations.

A.S.T.M. Steel Committee Plans to Consolidate Similar Specifications

■ BECAUSE of a large number of developments facing it in connection with its more than 100 specifications covering various types of steel and steel products, committee A-1 of the American Society for Testing Materials this year resumed its January meetings in Philadelphia. For the past several years this arrangement had been discontinued. Registration during the two-day period totaled about 130, and some 18 meetings including those of subcommittees were held.

Pronounced activity was observed on the possibilities of consolidating into a single specification steels of somewhat similar classes and grades now covered in different standards. As usual, great interest was evinced in the work on pipe and tubing materials, and materials for high-temperature service. Several groups are developing requirements for materials suitable for welding.

The group concerned with rails and track fastenings (E. F. Kenney, Bethlehem Steel Co., Bethlehem, Pa., chairman) is recommending adoption as standard of two existing tentative specifications covering high-carbon steel joint bars (A 5—36 T) and quenched carbon-steel joint bars (A 49 — 36 T). Clarification of requirements for the strip test in the specifications for carbon and alloy steel track bolts (A 183 — 36 T) also is being proposed.

The subcommittee on structural steel plates, shapes and bars (F. H. Frankland, American Institute of Steel Construction, New York, chairman) is acting to bring its tables of tolerances in line with manufacturers' latest recommendations. A decrease in the tensile strength range of the high-strength structural rivet steel specifications (A 195 — 36 T) is to be proposed. Since the rivet stock must be annealed, it was felt the previous 70,000-85,000 tensile range should be changed to 60,000-82,000 pounds per square inch to result in a material better suited to the requirements. Because of somewhat similar requirements, the committee believes it can consolidate the mild steel plate specifications (A 10 — 34) with those covering plates of structural quality for forge welding (A 78 — 33).

Requests for standardization work in the field of spring wire have led the group on spring steel and steel springs (C. T. Edgerton, Crucible Steel Co., New York, chairman) to organize a special section under chairmanship of F. P. Zimmerli, Barnes - Gibson - Raymond - Inc., Detroit, to develop standard specifications for music wire. This work will take some time; for the present the project will be limited to specification requirements for round spring wire exclusive of corrosion-resistant grades.

An important project of the subcommittee on forgings, headed by Dr. W. M. Barr, Union Pacific Railroad, Omaha, Neb., involves consolidation of carbon-steel requirements in three existing specifications covering forgings for locomotives, axle shafts and other forgings for locomotives and cars and the general forging specifications (A 18 — 30). Similar work in the alloy-steel group is being intensified. The committee recommends that the proof test be deleted from the requirements of the specifications covering normalized quenched-and-tempered alloy-steel forgings (A 63 — 38 T). This tentative standard as revised is to be referred to letter ballot for adoption as standard.

The existing standard for steel tires (A 26 — 16) has remained unchanged for almost 20 years and through the work of subcommittee VII, R. W. Steigerwalt, Carnegie-Illinois Steel Corp., Pittsburgh, chairman, a new tentative specification superseding this has been drafted. Changes are being recommended in the specifications for multiple wear and one-wear and two-wear wrought steel wheels, these changes providing clarification of requirements and making the specifications more easily usable.

Proposed new specifications covering alloy-steel boiler tubes will be submitted to letter ballot of subcommittee IX on steel tubing and pipe under chairmanship of T. G. Stitt, Pittsburgh Steel Co., Allenport, Pa. These include some 12 to

(*Please turn to Page* 82)

Seventh Annual Southern Foundry Conference Sets Attendance Record

■ EXISTING records for attendance at regional foundry conferences were broken at the seventh annual Southern conference at the Tutwiler hotel, Birmingham, Ala., Feb. 23-24. Registration totaled 686. Highlights of the two-day meeting, arranged by the Birmingham district chapter of the American Foundrymen's association, were six technical sessions, numerous plant visitations, a luncheon, and a banquet attended by 467.

Blast furnace production of foundry pig iron is much more exacting than for basic iron for conversion into steel, asserted C. S. Lawson, general superintendent of blast furnaces, Sloss-Sheffield Steel & Iron Co., Birmingham, presenting a paper at the opening session. To produce iron that will be satisfactory in making good, clean castings capable of meeting all requirements of soundness, strength, machinability, enameling, etc., the speaker stated extreme precautions must be taken at the furnace. Raw materials must have the proper analysis, and these materials must be of proper size to give even distribution of the voids when charged into the furnace. Blast volume also must be correct, it was pointed out.

Interesting points on effect of chilled pig iron upon castings made from that iron developed in discussion. It was stated that while the foundrymen's aversion to use of chilled pig iron in the cupola may be based partly on superstition, investigations have disclosed that iron poured from such pig may have white sections in the castings. Concerning relative merits of small and large pigs, the suggestion was made that diameter has more effect than length, but size is immaterial if the iron is melted hot.

Cites Enamel Problems

Relation of cast iron compositions to pin holes and blistering of porcelain enamels was discussed by D. B. Noland, Gray & Dudley Co., Nashville, Tenn. Pin holes and blisters are alike, he said, since pin holes are merely the skeletons or scars of blisters that appeared early in the firing cycle of the enamel—blisters that burst and did not heal over.

Broadly speaking, he continued, all pin holes and blisters are caused by gases evolved from the iron or from the interface of the enamel and the iron. In some instances, blisters and pin holes are caused by foreign inclusions in the enamel, from combustion and other gases in the firing chamber.

Citing instances of analyses taken over a 15-year period, the speaker claimed that the manganese-sulphur ratio exercises an important influence on the behavior of iron going through the enameling process. Good enameling iron should show a ratio of approximately 7 points of manganese to 1 point sulphur. Carbon equivalent should be around 4.3. Whether a sound casting, free from dirt, slag, free carbon, oxidized iron, kish and sand holes, will blister depends on the rate and degree of graphitization. If the combined carbon is in form to break down at low temperatures or early in the firing cycle before the enamel has fused and there are no combustible gases in the furnace, likelihood of blistering is small.

At the opposite extreme, if graphitization is slow and does not take place until after the enamel has fused, blistering does not occur. If the combined carbon is in form to change to graphitic between these two extremes, or at the critical period when the enamel is fused and ready to be removed from the furnace, a profusion of blisters may be expected in various stages.

Wage Scales Discussed

Speaking on the subject of "Job Evaluation," A. H. White, Stockham Pipe Fittings Co., Birmingham, described how his company established a system of rate classification.

The speaker criticized the policy of surrounding all wage scales with secrecy. That method of keeping down dissatisfaction in the lower brackets is not successful, for ill-founded rumors nullify intentions completely. Present trend of modern management is to inform employes more completely, not only on wages, but on other policies of the company as well. Mr. White believes best results are obtained by telling the new employe the wage range of the particular job and broadening opportunities for promotion into higher paying jobs. A tactfully handled job evaluation program, which does not present drastic shakeups, and a gradual lining up of wages on a sound basis, will reduce turnover, increase production and stimulate smooth operations, he contended.

Selection and uses of nonferrous alloys were discussed in a paper by John W. Kelin, Federated Metals division, American Smelting & Refining Co., St. Louis. In the speaker's opinion, several factors must be considered in selecting a suitable alloy. For example, one has to know the physical properties required, tensile strength, elongation, hardness, and possibly electrical or thermal conductivity.

Machining properties are of prime importance especially where careful machining and delicate tool finishing are required. Ease with which red brass can be machined is in odd contrast to the requirements of sharp tools and slow feeding necessary to prevent peening of high lead bronzes. Cost of an alloy is third most important factor. Mr. Kelin pointed out, however, that the lowest price metal is not always the cheapest; conversely, the most expensive metal is not necessarily the best under a given set of conditions.

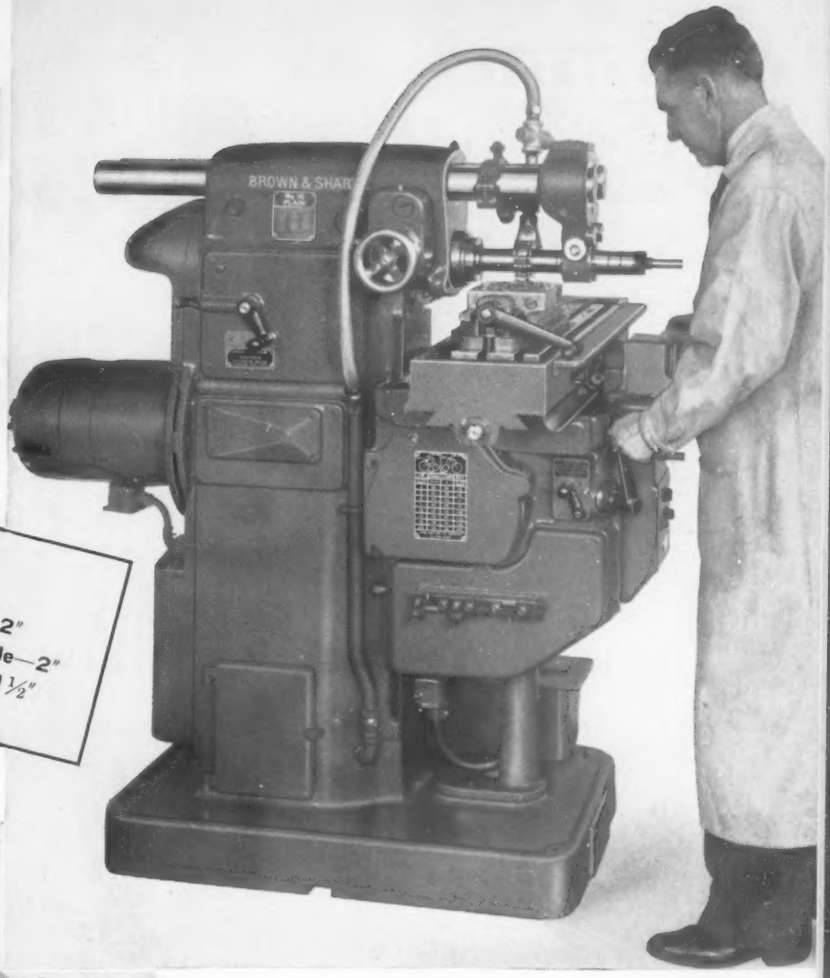
Brass Foundry Pactice

Contained in the paper was a chart which was virtually a condensed encyclopedia on brass foundry practice, giving information on compositions, physical properties and uses of a wide range of copper alloys. Second section of the paper covered casting defects, causes and remedies. Frequently defective castings result from a number of causes. Usually answers to the following questions will reveal the cause of the trouble: Is the alloy suitable for the job in hand? Is the metal melted and poured at the proper temperature? Is the proper flux used? Is molding practice correct, gates, risers, vents, etc? Is the sand suitable for the job? Are cores made properly?

Necessity for business men to take an active part in the political administration if we are to come out of the slough of despond, balance the budget and once more flourish as a prosperous nation, was stressed by Donald B. Gillies, vice president, Republic Steel Corp., Cleveland and newly installed president, American Institute of Mining and Metallurgical Engineers, speaking at the banquet. A disturbing factor in the general situation is the increasingly active part government is taking in business, he said. A new set of rules is being introduced. The business man does not know how to evaluate events as he did formerly.

Until some of the fundamental troubles in this country have been cured, the speaker claimed, it seems futile to talk about transient business recovery. We may have sudden upturns, but if the past few years are indicative, there will be corresponding downturns. Permanent recovery never can come, he asserted, until a smaller proportion of our national income passes through government hands and an increasing amount passes through hands of business and industry.

Nos. 10 & 12 HIGH PRODUCTION MACHINES



10 ELECTRICALLY CONTROLLED
Longitudinal Feed of Table—*12"
Transverse Adjustment of Spindle—2"
Vertical Adjustment of Knee—11½"
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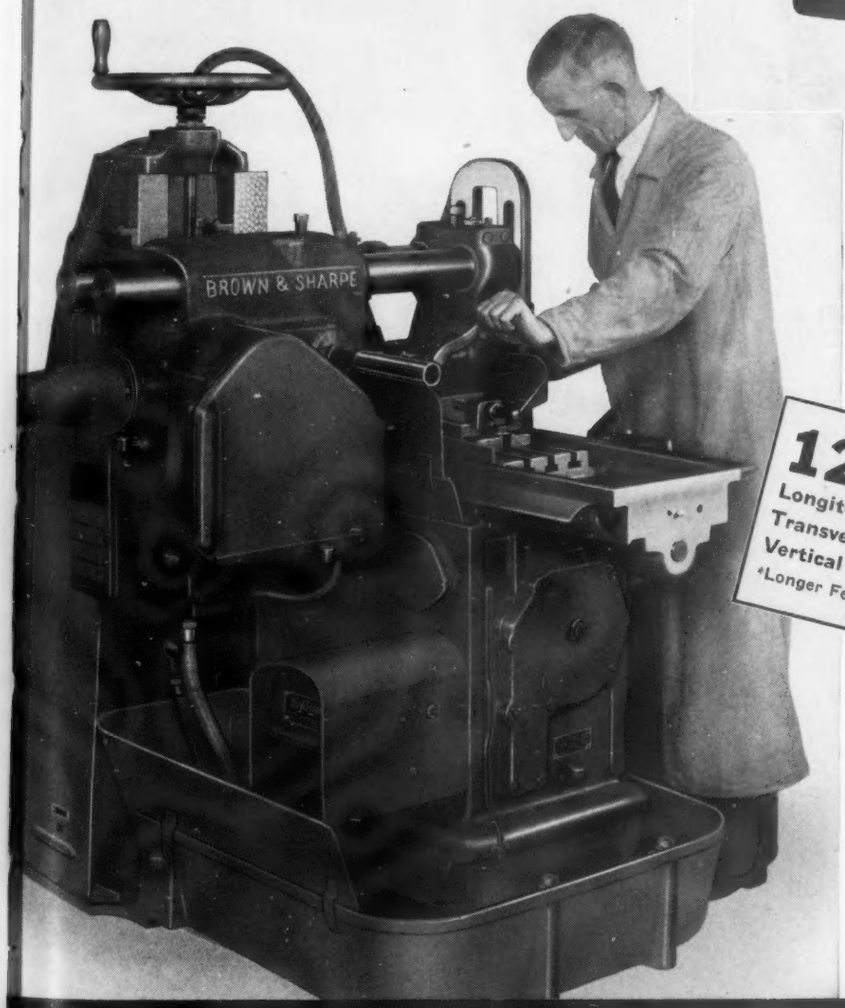

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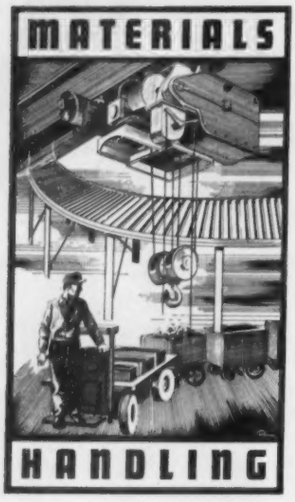
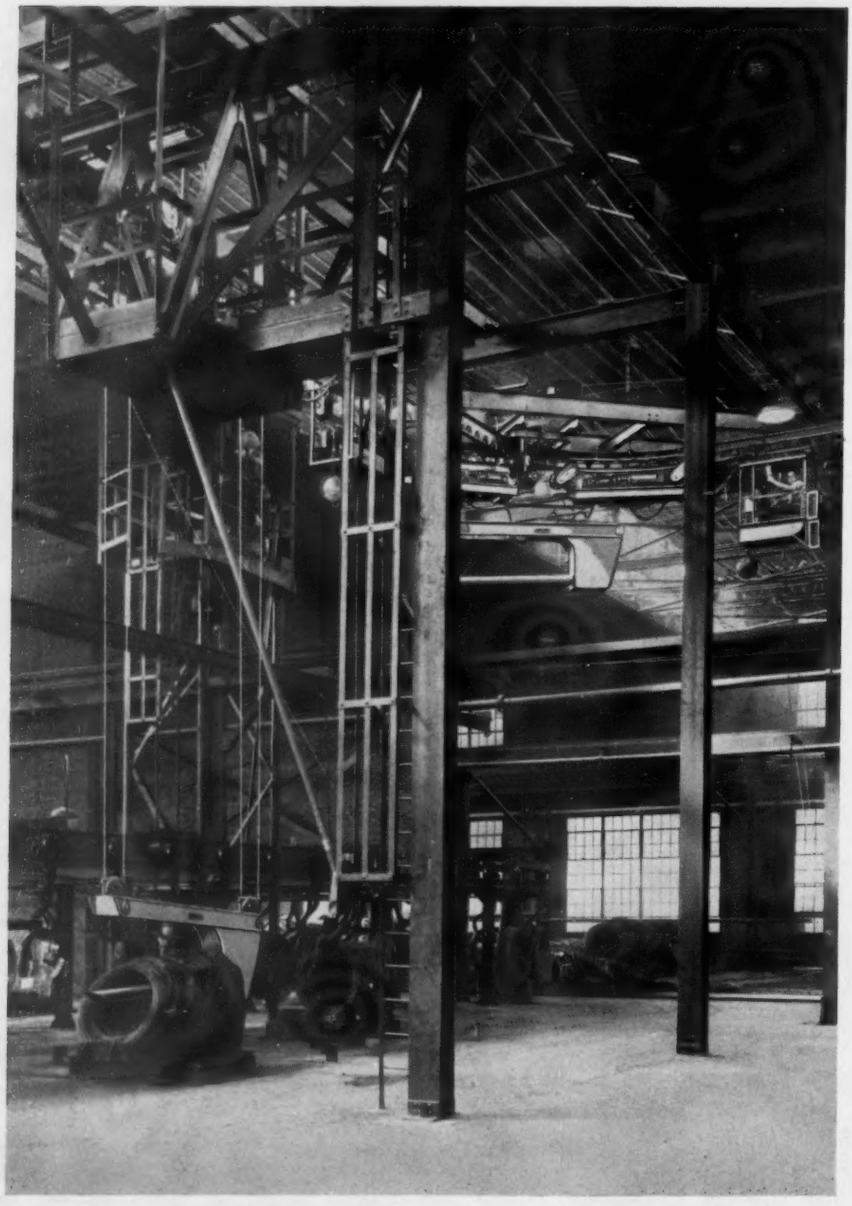


Rod Handling

A 2½-mile tramrail system handles output from two rod mills to 11,000-ton storage, shipping platform or cleaning division. Pushbuttons in tramrail cabs operate printing device on automatic track scales. Storage work requires no ground operator



■ EFFICIENT handling of rod bundles by an overhead tramrail system is one of the many interesting features in the new continuous rod and bar mill at the Sparrows Point, Md., plant of Bethlehem Steel Co. The conveying system, possibly the largest single installation of this type yet completed, includes about 2½ miles of overhead track work.

Forty-one bins, arranged in three bays joining in a central switching terminal, are provided in the storage and shipping building. A depressed, standard gage railroad track runs into one of the bays which serves as a shipping bay; the second bay connects the storage with the cleaning and baking department of the wire mill; while the third bay is used exclusively for storage.

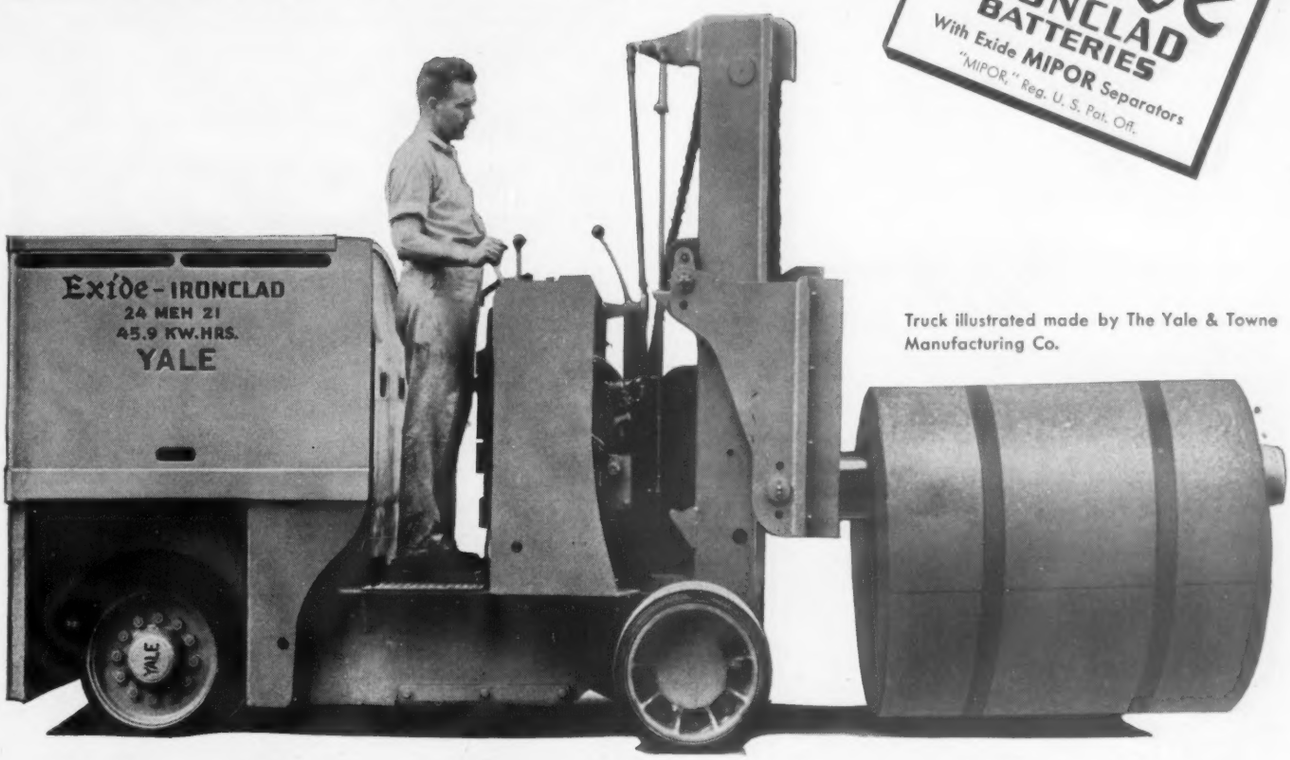
All regular bins are 20 feet wide by 50 feet long and have five parallel overhead tramrail tracks. They therefore will accommodate five tiers of rod bundles which can be stacked to a height of about 20 feet above the floor. The center and the two outside rows of bundles rest directly on the floor of the bin, while the two remaining rows rest on timbers laid on a raised concrete structure. This staggered arrangement of the bundles makes them easily accessible and provides better and neater storage.

Four of the bins, in the shipping bay at end adjoining the switching terminal, are shorter than the regu-

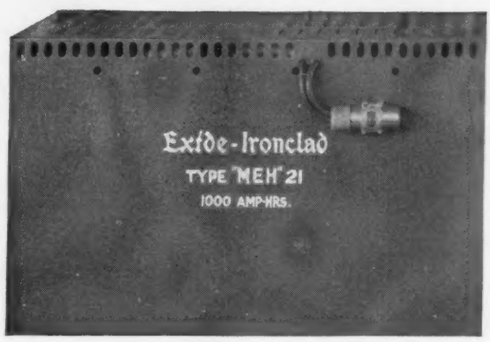
Here rod is being removed from accumulating cars at discharge end of the No. 1 rod mill cooling conveyor. Framework in foreground fastened to upper portion of column supports track scale. Tramrail operator simply runs load on section of track and scale automatically weighs load

What is the biggest production news of the year?

Exide IRONCLAD BATTERIES
With Exide MIPOR Separators
"MIPOR," Reg. U. S. Pat. Off.



Truck illustrated made by The Yale & Towne Manufacturing Co.

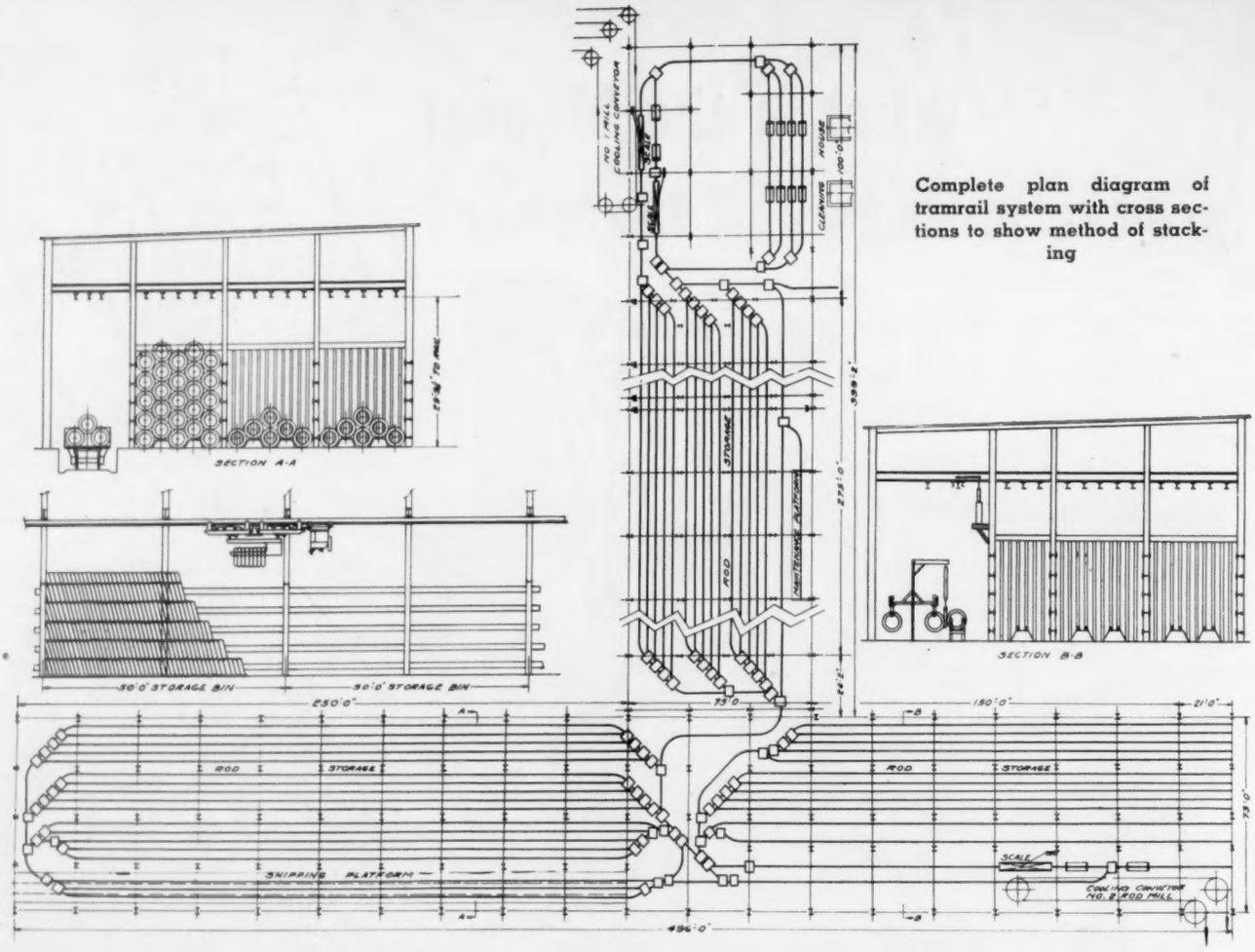


FROM the standpoint of industry generally, the most important production news in many months comes from the field of materials handling. Giant, strong-sinewed battery electric trucks have been built... and new power-houses in the form of storage batteries. The new Exide-Ironclads, type MEH, compactly assembled in steel trays, meet modern industry's demand for truly tremendous power. More than 45 kilowatt-hours are available in a single unit!

In many other ways, Exide has increased the production value of these trucks. The new Exide Discharge Indicator keeps the service running on schedule by flashing a warning when a battery is nearing discharge. The new Exide Charge Control Unit handles the charging of batteries with negligible attention. The new Exide "Mystery Kit" analyzes your handling jobs, showing how much battery capacity each truck requires per shift.

Most important, of course, are the new Exide-Ironclads, that insure speedy, dependable, low-cost handling, no matter how large the truck or severe the service. Write for free booklet, "In Selecting Any Motive Power Battery."

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

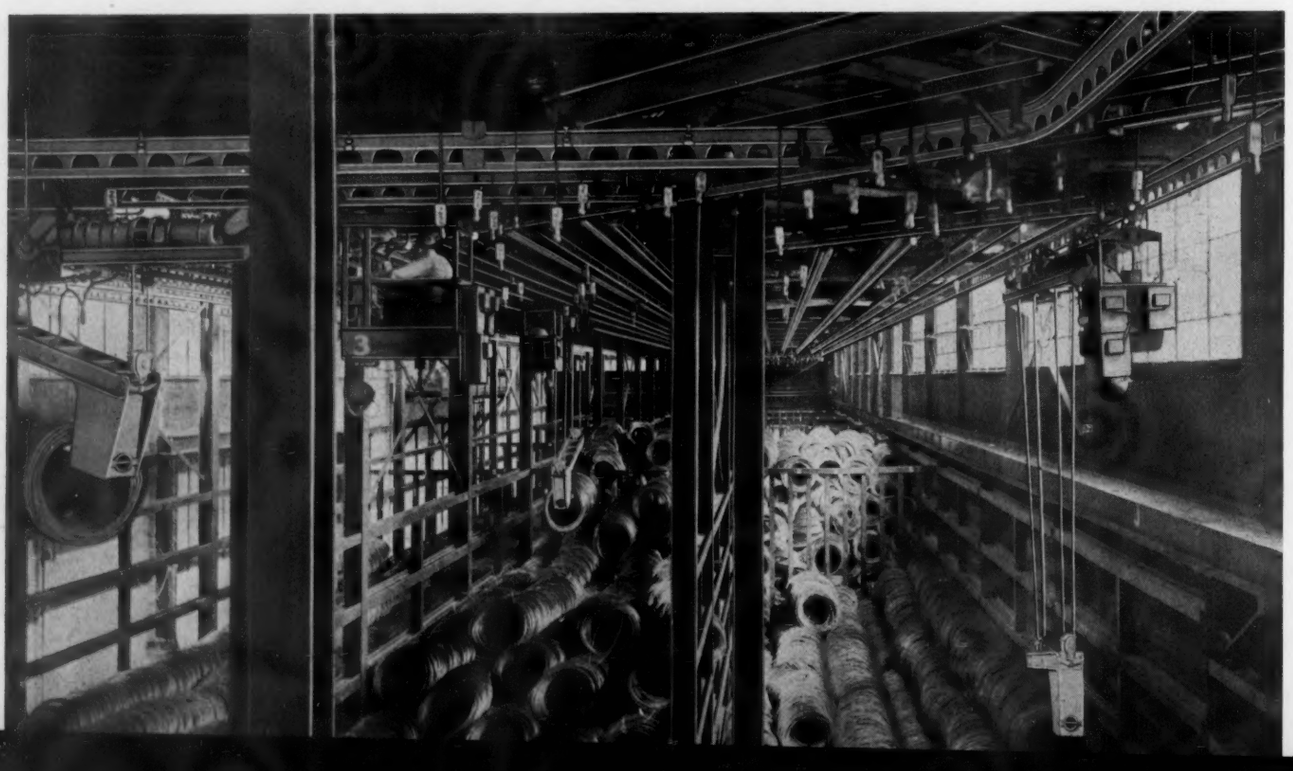


Complete plan diagram of tramrail system with cross sections to show method of stacking

lar bins, being only 25 feet long, instead of 50 feet. In the storage bay, one row of four bins has only three overhead tracks and is made narrower than the rest, accommodating three rows of bundles instead of five. All other bins are the regular size and hold about 300 tons of rod apiece. This gives a total storage capacity of over 11,000 tons. Bins are formed from heavy structural members which are covered with boards on the inner surface to protect the bundles.

Six carriers with attached operating cab and hairpin hooks are available; normally five are in regular use, the sixth serving as a spare. Each carrier is equipped with six reversible motors, four 1-horsepower motors for traveling and two 7½-horsepower motors for hoisting. This makes a total connected load of 19 horsepower for each cab. A unit is capable of carrying 5000 pounds; eight to ten rod bundles is the maximum capacity of the carrier hooks.

Storage bin in rod transfer bay. Rod here is stored six rows high. Hook operator in cab at left is picking up a load. Operator at right is depositing a load



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NORTON COMPANY
Worcester, Mass.

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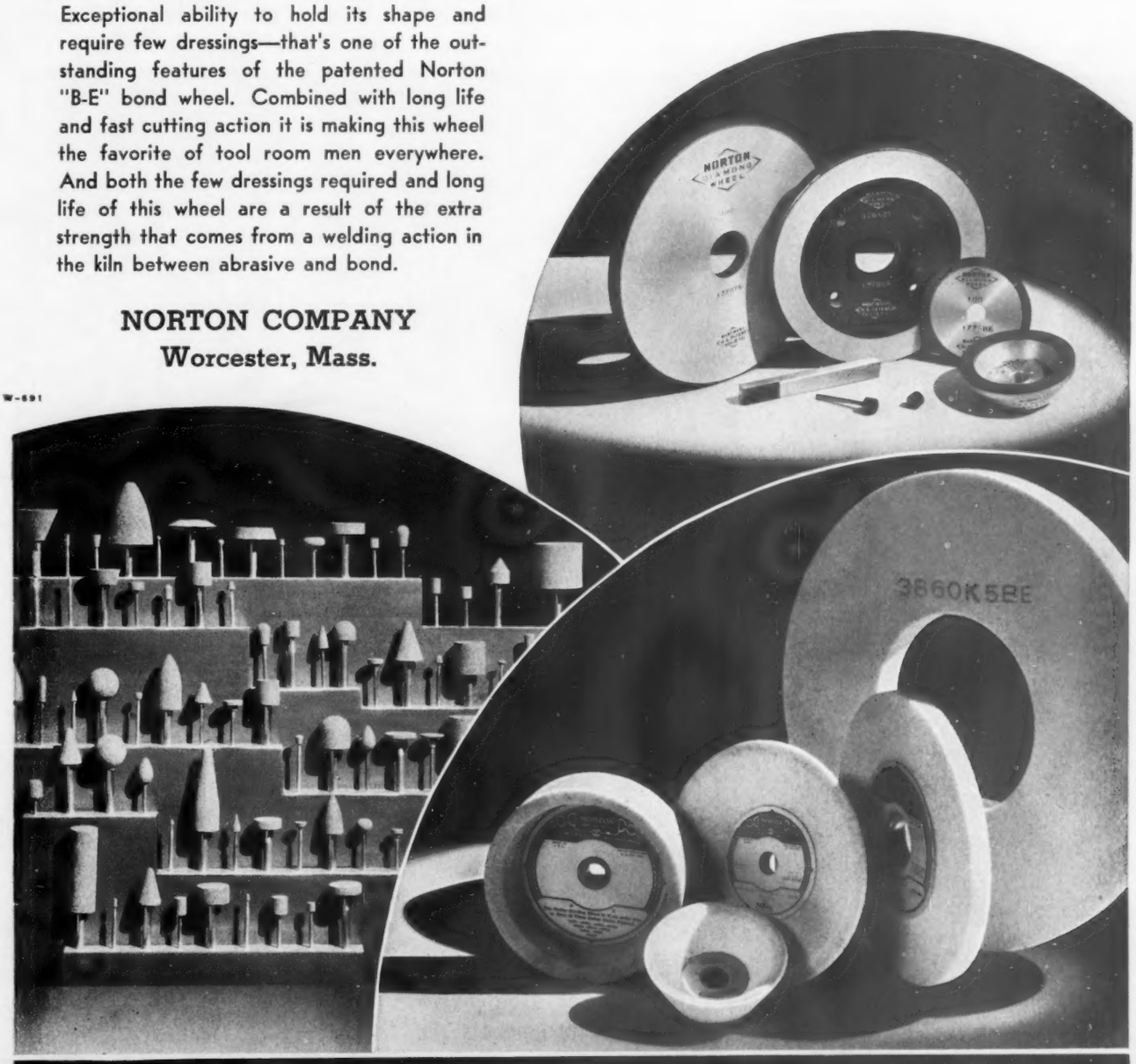


NORTON ABRASIVES

Total weight of the unit, exclusive of the load, is only 4500 pounds. For comparison, a crane with 100-foot span would weigh 160,000 pounds. Four such cranes would be required to do the same work as the five carriers.

The carriers run on a special built-up track consisting of an upper section of standard structural steel welded to a lower section with a flat running tread and made of high carbon steel. Maximum traveling speed is 600 feet per minute, maximum hoisting speed 65 feet per minute. Switches are located in all tracks at both ends of all bins, a total of 98 switches in the system. The small squares on the track lines in the layout diagram denote switches. To change from one track to another, the carriers must always return to the end of the bins. The switches are equipped with signal lights and are operated from the cab by ropes and handles which may be seen in several of the illustrations.

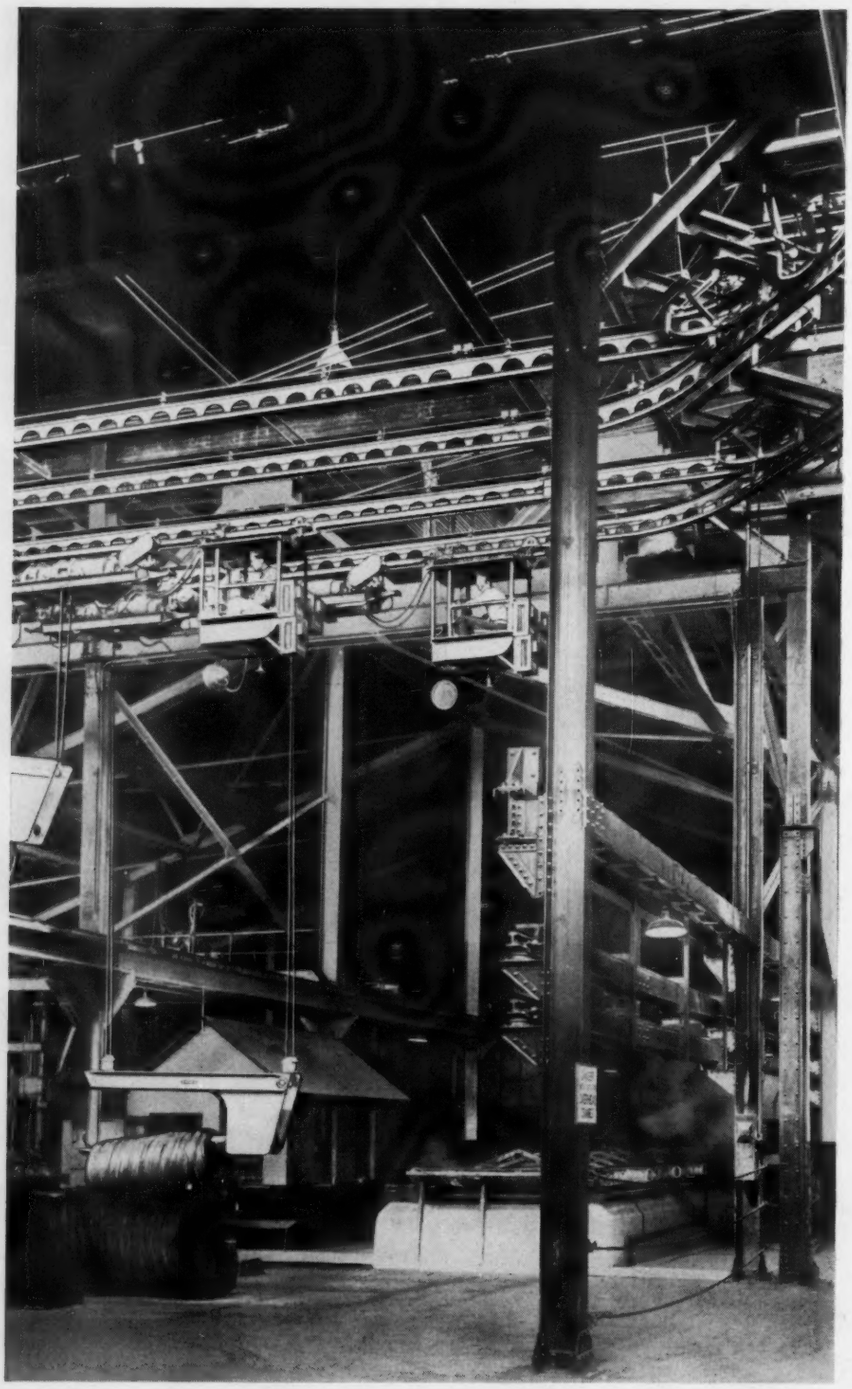
Finished rod bundles are discharged from the rod mill reels to 330 foot, open top, chain type conveyor. From this unit the bundles are transferred automatically to a 560-foot double hook carrier which runs to the switching terminal in the shipping and storage bay. During this transport, the bundles cool sufficiently to allow inspection, trimming and tying.

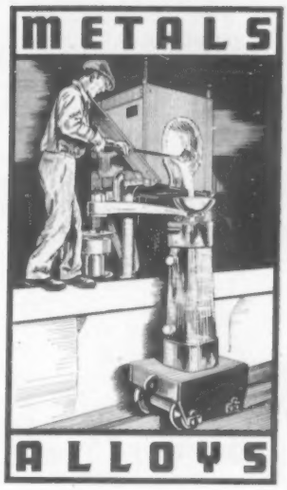
Bundles then are removed from the carrier by air operated lifting

(*Please turn to Page* 81)

Loading a gondola car by hairpin hook and tramrail carrier. Material is loaded directly from the mill or from storage bins

Rod from cleaning operation is placed in racks under cleaning house crane runway. Eight loads can be placed under each crane





Bronze Worm Gears

Good practice demands a bronze that combines lowest coefficient of friction with maximum physical properties. Then with a high quality steel gear, good workmanship and adequate lubrication, gearset will last indefinitely

By J. A. HATCH
McCallum-Hatch Bronze Co. Inc.
Buffalo, N. Y.

■ AT THE inception of worm gearing in the automotive field, designers were most likely guided by their experience in the bearing field in their choice of metal for the worm gear. The worm itself obviously had to be of the strongest material available—steel. For the worm gear, the similarity between the working conditions of a worm gear and a bearing suggested the use of an antifrictional metal. In this case, the physical properties had to be considered also. Finally a bronze fairly high in tin was tried and found to be successful.

The theory of antifrictional metals was built on observation of different metals in service as bearings, and a study of their structure and composition. The conclusion was reached that a bearing metal or antifrictional metal should be an alloy of duplex structure, hard crystals distributed uniformly in a softer matrix. This permits the hard crystals to adjust themselves to the pressing surface in the softer matrix which wears somewhat more than the hard crystals. The latter, being now slightly in relief, become the load-supporting crystals. The surface of the softer matrix, being slightly lower, forms an oil pocket and assists in retaining the oil film.

When tin bronze alloys, adopted for worm gears, are cast in sand molds, they possess a duplex or two-phased structure which may be described as a mixture of two alloys, each composed of copper and tin but in different proportions.

It is the property of many alloys to form phases of different composition on freezing. In gear bronze of 89 per cent copper and 11 per cent tin, one phase contains more than 20 per cent of tin, which forms the hard crystals metallographically designated as Delta crystals. The other phase may contain from 5 to 11 per cent of tin, depending on the quantity of hard phase allowed to form.

As far as bronzes are concerned, it is not their antifrictional property "per se," but their structure that makes them antifrictional metals. This is proven by the fact that a good bronze bearing will become perfectly useless as such when heat treated to change the structure from heterogeneous to homogeneous.

Hard Crystals Stand Out

Some critics say hard crystals in metals are valueless as supporting elements because of their being pressed into the matrix. This may happen to a certain extent, but there should be present an amount of hard crystals of sufficient size, proportionate to the loads to be carried. When the Delta phase is in sufficient quantity, there is almost a structure or network of it offering a resistance to the load. Microscopic examination of surfaces of teeth of worm gears reveals Delta crystals without etching, and they seem to stand out in relief.

Definite measurements have been made on motor car worm gears which had worked for more than 70,000 miles. There was a slight but definite difference in level between the Alpha and Delta crystals. The hard crystals stood out in relief to the extent of 4 to 6 microns above the softer.

Bronze, as a result of internal shrinkage and phase transformation, usually has an open structure when cast in the sand with slow cooling. This is especially true in castings where the cross sections are fairly heavy. Rapid cooling from the periphery of a gear blank inward, and at the same time efficient feeding in opposite directions through the risers, will produce a dense casting of higher hardness and strength than an ordinary sand casting. Unfortunately, the antifrictional properties of a gear blank produced in this manner are lower. The reason for this is that the rapid cooling interferes with the formation of the duplex structure so desirable in a good bearing bronze. To combine the two, that is, density obtained by chilling and the duplex structure of a sand casting, has long been the problem of the bronze foundry.

It was found, some years ago, that a tin bronze with a small percentage of nickel would overcome the bad effect of chilling on the structure of the bronze.

A nickel-bronze gear blank can be chilled sufficiently to increase the strength and density. Yet it will allow development of the duplex structure as well as in a sand casting. The explanation is found in the ternary system of copper, tin and nickel. When nickel is added to the copper-tin system, the phases separating on freezing are changed both in composition and physical characteristics. Nickel, having the same atomic volume as copper, has more affinity for copper than tin.

Result is less tin is held in the first phase, which forms soft crystals (Alpha), and more tin goes into the formation of a second phase which corresponds to the Delta phase in straight copper-tin alloys. However, this second phase is different in structure in that it is not laminated like Delta but is a solid formation which makes it a better supporting crystal.

The phase formation and transformation that takes place in alloys

Abstract of paper presented at 21st semi-annual meeting of American Gear Manufacturers' association, Skytop, Pa.

on and after freezing is of greatest importance to the utility of alloys. We all recognize its importance in hardening and tempering steel. In the nonferrous field, certain alloys may be made more useful by proper control of phase formation. Also certain valuable properties can be lost entirely by improper handling.

An alloy cast in sand will seldom actually develop a structure corresponding to its composition. Thus the actual structure is not what it would be if it were cooled at a rate sufficiently slow to bring it to a state of equilibrium where a still slower cooling would not change it any more.

With tin bronzes containing up to 16 per cent tin, there is an anomaly in phase formation. The duplex structure obtained in castings is not in accordance with its composition. As mentioned before, the hard crystals will be absorbed upon annealing. Also, its formation is prevented to a certain extent by chilling. It is not formed on extremely slow cooling. For this reason, different structures are obtained in chilling large and small gear blanks, though the size of the chills may be proportionately large.

While gear blanks of sizes used in trucks have a duplex structure fairly well developed when chilled, a large gear of 89 per cent copper and 11 per cent tin, such as used in worm gearing in modern rolling mill practice and having a cross section of say 25 square inches, will show complete absence of hard crystals, whether sand cast or chilled. This is because a large mass of metal will cool at a sufficiently slow rate even in contact with chills, to bring the metal to the state of equilibrium.

When a small percentage of nickel is present, the hard supporting crystals form in sufficient size and quantity, regardless of size of castings or chills. This fact makes nickel bronze more desirable for chilled gear blanks, either large or small.

Lead Adds Machinability

Adding lead to bronzes is practiced to a considerable extent. When added to molten bronze, lead dissolves readily and forms a liquid solution and separates out in freezing to form small globules, normally evenly distributed throughout the mass. These small globules facilitate machining to an extent depending on the amount of lead present in the alloy. With much lead, the chips are short and there is no heating.

Small quantities of lead, up to perhaps ½ per cent, have no appreciable effect on the strength of the bronze. Quantities up to 5 and 10 per cent are used in bronze designed for soft steel worms and no great loads. An alloy of 85 per cent copper, 10 per cent tin and 5 per cent lead is a standard bronze for elevator worm gears, where the worms are made of soft steel and not hardened. The lead content in this alloy tends to give a more quiet running unit, an important factor.

Reduces Friction

The presence of lead aids in "running in," in the property of conformability, and makes it easier on unhardened worms. Lead also adds to the antifrictional property of the bronze but reduces the resistance to compression and wear under extreme loads. When the lead content is fairly high, the bronze has a tendency to tear when heavy cuts are taken, and care should be exercised to allow sufficient metal for proper finishing cuts to insure a smooth surface.

Bronze having the best antifrictional value will not necessarily have the greatest other physical properties by comparison with high strength alloys. High strength bronzes were developed primarily for strength, resistance to shock and compression, and for corrosion resistance. A study of their structure explains why they fail to give as good service as tin bronzes when used for worm gears. The high coefficient of friction is the result of their structure which does not possess sufficient difference in hardness between the major phases of the alloy, though not entirely homogeneous.

The more prominent rivals of the nickel-tin bronzes in the worm gear field are aluminum bronze, manganese bronze and, to a much lesser degree, silicon bronze.

Aluminum bronze used for worm gears, either as sand castings or in a heat-treated condition, consists generally of 10 per cent aluminum, a small percentage of iron and the balance copper. Often 1 to 4 per cent of iron is added and the aluminum is varied from 8 to 11 per cent. Normally, it is a two phase alloy when in a sand or chill cast condition, which fact makes it a fairly antifrictional metal. The difference in hardness of crystals of different phases is insufficient to allow development of an ideal bearing surface. It is used for worm gears. Here its resistance to shock is of prime importance as its capacity to resist fatigue puts it ahead of all nonferrous alloys.

Large quantities of aluminum-bronze worm gears have served successfully in light trucks where the speed was high and the load not great. Applied to heavy duty equipment by the same firm, the gears failed. Under the greater loads, the wear was excessive. When tin bronze gears were substituted in this heavy duty application, they gave excellent service.

Aluminum bronze serves well in other types of gears where sliding friction is small such as in spur, bevel, helical and internal types. It is used in a sand cast or heat treated condition, preferably with hardened steel mating gears. Aluminum bronze lends itself readily to heat treatment, the tensile strength increasing 50 per cent with yield point and hardness doubled.

Aluminum bronze is a sensitive alloy to handle in the foundry. It demands exacting control if the phase formation is to be retained. This is especially important in the case of castings having a large cross-sectional area where slow cooling just below redness promotes transformation of one of the phases of the alloy into a brittle eutectoid. Though this makes the casting quite brittle, it is readily corrected by heat treatment.

Manganese bronze, by its composition of copper, zinc and about 2 to 3 per cent each of iron and manganese, and 5 to 9 per cent of aluminum, is properly classed as brass; iron-aluminum-manganese brass. Its base, copper-zinc or true brass, has a bad reputation as an antifrictional metal. Though the addition of iron, manganese and aluminum adds greatly to its other physical properties, it does not improve its poor antifrictional properties. Structurally, it is practically homogeneous with large quantities of hard minute iron-aluminum crystals, too small and too far apart to be considered load supporting.

Has High Coefficient of Friction

Manganese bronze, with its strength of 100,000 to 125,000 pounds per square inch, yield point of from 75,000 to 95,000 pounds per square inch and brinell hardness of from 200 to 250, often appeals to the engineer as a worm gear material, and its lack of antifrictional properties is overlooked. It is never recommended for high speed worm gears. It may give long service where the motion is slow, but its efficiency is low on account of its high coefficient of friction.

Wherever manganese bronze worm gears are giving satisfactory service, they are considerably larger in size than nickel-tin bronze gears in similar service. This would indicate that it is necessary to increase the size of the worm gear to increase the area of contact between worm and gear if manganese bronze is to be used.

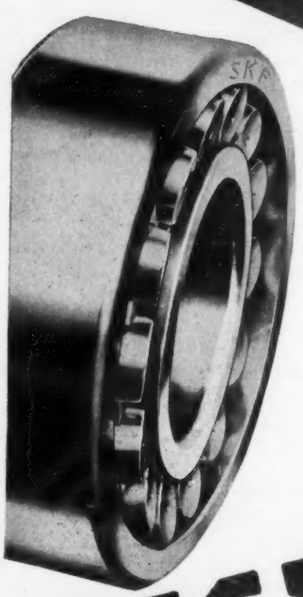
Obviously, there is no economy in using manganese bronze, the pound price of which may be lower than other bronzes, if the ultimate cost is higher due to extra cost of machining the larger gear and

North or South

BUILT BY MESTA MACHINE CO.

GOOD MILLS MUST HAVE GOOD BEARINGS

● 5-Stand Tandem Tin Plate Mill at Fairfield, Alabama



SKF *Bearings*

Steel mill men everywhere—North and South—know that modern bearings keep pace with new methods, high speeds and heavy loads of present-day rolling mill equipment.

Modern bearings stabilize the back-up rolls of this Mesta 5-Stand Tandem Mill. They are SKF Spherical Roller Bearings—self-aligning to compensate for deflections, distortions or weave without binding.

In addition, the reliability of SKF Bearings led to their use on Crocker-Wheeler hot mill motors. Depend on SKF Bearings and you can depend on any machine of which they are a part. SKF INDUSTRIES, INC., Front St. & Erie Ave., Philadelphia, Pa.

4296

worm, and the use of larger supporting bearings etc.

Likewise, experience shows there is no necessity of using high strength alloys in worm gearing for their strength alone because high grade antifrictional bronzes as produced today have much greater strength than in the past.

Silicon bronzes are alloys of copper with from 3 to 5 per cent of silicon and from 1 to 3 per cent of either iron, nickel or manganese. The silicon-iron-copper combination has received some attention as a worm gear material. As a substitute for tin in bronzes, silicon answers the purpose for many requirements. It has been tried in trucks and buses with occasional success, probably where the conditions were not severe. Structurally, it is not an antifrictional metal. It is practically a one phase homogeneous alloy, containing a quantity of minute Fe-Si crystals which cannot be considered as load supporting crystals. Its physical properties are lower than those of nickel-tin bronze.

Low Friction Valuable

A recent experience in testing bronzes for efficiency brings out clearly the value of using an alloy with a low coefficient of friction. Three different bronze alloys were used: A tin bronze, a manganese bronze and an aluminum bronze. The test was made with a hand powered lifting jack operating on a steel screw and a bronze nut. This jack was placed in a hydraulic cylinder and pressure applied. The effort required to raise the jack was measured by a dynomometer. It was found that the tin bronze was as much as 66 per cent more efficient from the standpoint of effort required to raise the load than either manganese bronze or aluminum bronze. This test is even more interesting when it is considered that it was made at extremely low speeds.

It has been my purpose thus far to establish that, because of the relationship of the coefficient of friction to the efficiency of a worm and gear, good practice demands a bronze that combines the greatest possible bearing values with sufficient strength to carry the load.

The subject of the steel worm is purposely omitted here for the reason that ferrous research engineers have carried on a broad research program for the perfecting of steels for this purpose. However, the highest possible workmanship should be employed in cutting and finishing the worm to secure maximum life from the bronze gear. Invariably, the gear will give added life where properly ground and polished hardened steel is used.

Frequently I am asked for a method of selecting the proper bronze specification to use for worm gears. Granted that a high quality of steel is used and approved workmanship is employed, select the highest quality of bronze showing lowest coefficient of friction and maximum physical properties. This combination of steel and bronze, with workmanship of a high order and with adequate lubrication should produce a worm gear that will last indefinitely.

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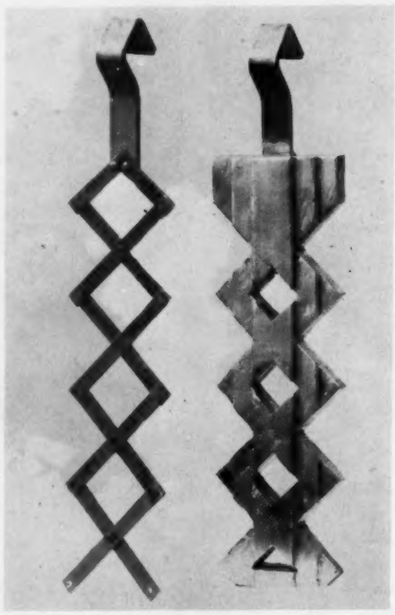
Lead Anode Is Developed For Chromium Plating

■ Securus Lead Products, Cleveland, announces a new type of lead anode for chromium plating and other electrolytic processes. The construction embodies a lattice type frame of strip copper upon which a thin film of pure lead is deposited and firmly bonded by a special process. This lead then serves as an integral homogeneous base on which the lead anode is built up to the desired thickness.



New type lead anode at right is built up from copper frame shown at left

Since all parts of the lead are supported by the highly conductive copper frame, low resistance and great rigidity are obtained at all points. A final treatment with a lead-burning flame consolidates the lead coating to maximum density and assures freedom from porosity and blowholes, it is said. Other advantages claimed include unusually low electrical resistance, resulting in a saving in power; more even current distribution at all points of the active surface; and unusual resistance to bending and warping. These anodes are made both to standard dimensions and in special sizes as may be required.

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Forum on Re-employment

(*Concluded from Page* 47)

the federal government can do is to *undo* or modify its errors of the recent past.

Among the steps toward undoing what has been done, here are five of paramount importance toward stimulating healthy and sustained revival of the durable goods industry and therefore of employment:

1. Cessation of government competition and threats of competition with private enterprises, especially where such competition probably has diminished the total of production, income and employment. *This would be followed by enormous expansion in construction, public utilities and private manufacturing.*

2. Renunciation of the policy of regulative taxation either punitive or incentive, and resumption of a policy of taxation for revenue only. *This would offer to private capital the encouragement it must have to incur new risks.*

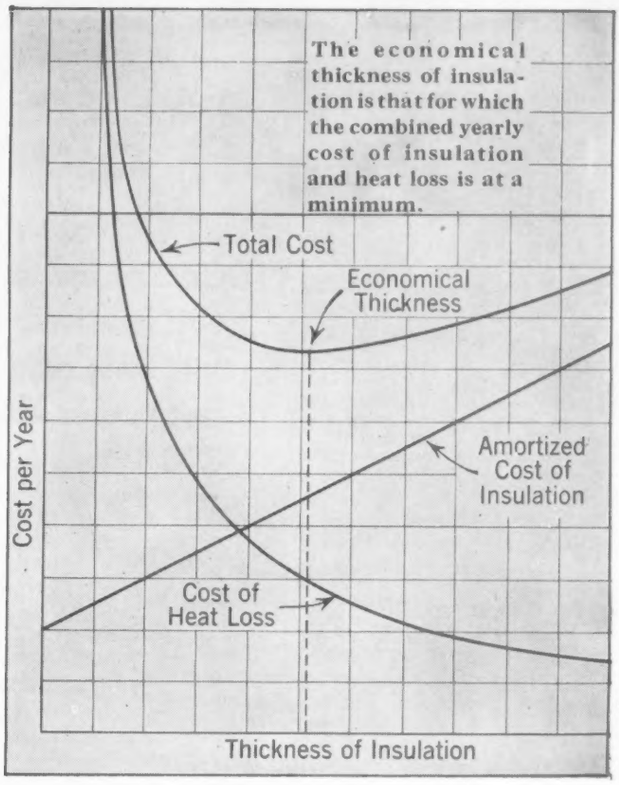
3. Cessation of experiments calling for or resulting in restriction of private investment, freedom of individual enterprise and limitation of productive effort. *This would bring about readjustments in demand and supply that must lead to a free and normal flow of goods from producers to consumers.*

4. Curtailment of federal monopoly of demand upon savings and its continued absorption of capital and credit for deficit financing. *Speedy withdrawal of the federal government from the capital markets would release vast sums from private employment in productive enterprise and simultaneously offer the encouragement of financial stability so necessary thereto.*

5. Encouragement of class cooperation rather than class cleavage and modification or repeal of discriminatory and class legislation. *Co-operation between management and labor, so long discouraged by unwise labor legislation, can—by the same token—be developed through repeal or drastic revision of those self-same laws.*

Any of these moves will contribute immediately to revival of durable goods manufacturing, consumption and general employment. And even though they are made only in part, there is still sound reason to believe that through them 1939 thereupon can be made to mark the beginning of true recovery—recovery which probably can be sustained for an indefinite period.

How to SAVE THE MOST MONEY with INSULATION


The economical thickness of insulation is that for which the combined yearly cost of insulation and heat loss is at a minimum.
Total Cost
Economical Thickness
Amortized Cost of Insulation
Cost of Heat Loss
Cost per Year
Thickness of Insulation

Make sure all your equipment is insulated with the *correct materials* in the *one correct thickness* that combines maximum operation efficiency with minimum heat waste

WHETHER or not your insulation is a paying investment depends entirely on the materials used and the amount applied. *Too much* will never pay an adequate return . . . *too little* results in heat losses that build up excessive fuel bills. But proper insulation, properly applied, will avoid both these costly mistakes. And a J-M Engineer will be glad to work out the most economical application.

Let him go through your plant and make a thorough study of your requirements. He'll give you the benefits of all the knowledge and data that Johns-Manville has accumulated during 81 years of research and practical experience on insulation problems. He can show you—from the complete line of J-M Insulations in brick, block and pipe-covering form—what materials are best suited for all your equipment. He can tell exactly how much insulation you can profitably use, and his recommendations will point the way to worth-while reductions in your fuel costs.

J-M Insulation Engineers have saved many individual plants thousands of dollars a year. There's a good chance they can do the same for you. For full details on J-M's free Engineering Service and on J-M Insulating Materials, simply write Johns-Manville, 22 East 40th Street, New York City.

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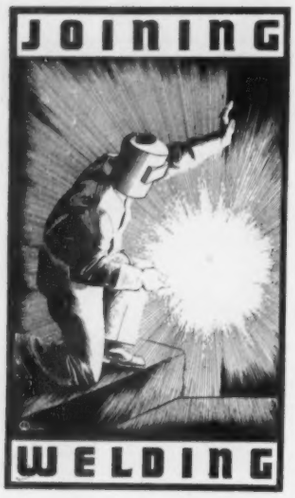
Johns-Manville INDUSTRIAL INSULATIONS

For every temperature . . . For every service condition

Reduce Your Fuel Costs in 1939



Elastic Stop Nuts

Combination of metal nut and integral fiber collar eliminates axial thread play by preloading bolt and nut threads, prevents movement of nut under severe vibration, seals threads. Some 500 types handle wide variety of special jobs

By H. B. THOMAS
Vice President
Elastic Stop Nut Corp.
Elizabeth, N. J.

■ INTRODUCED some ten years ago, a type of nut known as the elastic stop nut has been widely applied to structures where a vibration-proof bolted connection is desired. There are now more than 500 different types and sizes available, indicating the great expansion in application of this device.

Typical of the exceedingly severe service to which these nuts are subjected is on rock drills where steady, high speed vibrations of the most severe type pound away at the nuts holding side rods, feed bracket supports, tool holders, drill studs and handle bars.

Elastic stop nuts utilize the close fit between the nut and bolt threads on the load carrying sides created by the action of the bolt as it enters the fiber collar. This eliminates all axial thread play and prevents any movement of the nut under the most severe vibration.

Studies originally made into the problem indicated that axial play when combined with any factor which momentarily released the pressure between bolt and nut threads, caused the nut to walk away from the support against which it was drawn. This study indicated that if a nut could be developed that would eliminate all axial play and which would maintain constant pressure on the load carrying sides of the threads independently of the supporting surface, the nut would not work loose. An ordinary nut and bolt with threads fitted to eliminate axial play and to maintain pressure, of course, is not practical. However, by incorporating a fiber collar in a portion of the nut, the same effect can be obtained.

The fiber collar in an elastic stop nut is not threaded. Its internal diameter is slightly smaller than the internal thread diameter. This collar is cotton cellulose, chemically hardened to produce a tough horn-like matter unaffected by immersion in hot or cold water, ordinary solvents or oils. It will not harm bolt threads or damage plating. When an elastic stop nut is applied, the action is quite similar to an ordinary nut until the bolt reaches the fiber washer. When the bolt reaches the fiber collar, it tends to push the fiber up because the hole in the collar is smaller than the bolt and the hole is not threaded. This sets up a heavy downward pressure on the bolt automatically throwing the load carrying sides of nut and bolt threads into positive contact, eliminating all play in the threads and setting up friction between every bolt and nut thread. When this pressure reaches a maximum, the bolt threads impress themselves into the fiber. They do not cut a thread.

After the bolt has been forced all the way through the fiber collar, the downward pressure remains constant. The combination of frictional breaking effect of the fiber on the bolt and the metallic friction set up between bolt and nut threads, in addition to elimination of axial play,

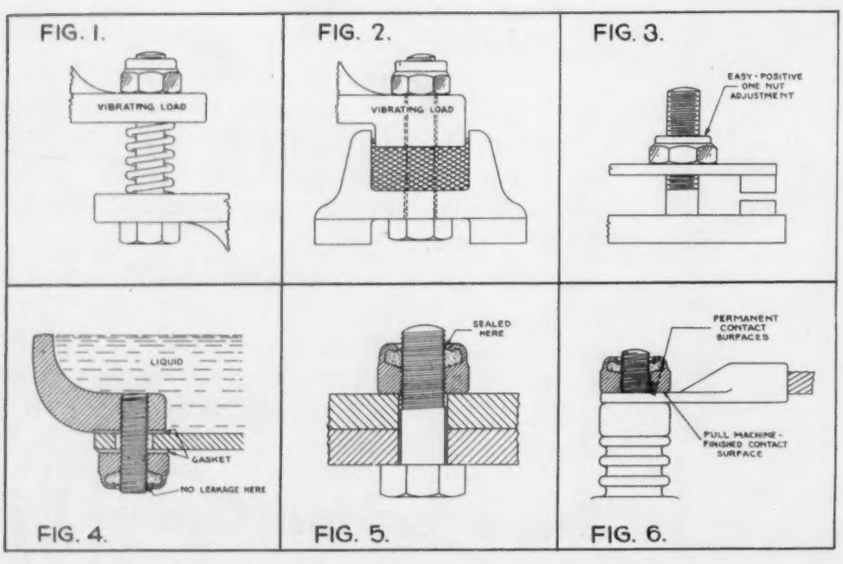


Fig. 1—For spring mounted connections where nut must stay put or is subject to adjustment. Fig. 2—For rubber insulated and suction mountings where nut must not work up or down. Fig. 3—On make and break adjustment studs where accurate contact gaps are required. Fig. 4—Where elimination of leakage past stud threads is necessary. Fig. 5—Here nut protects bolt or stud threads from corroding elements. Fig. 6—Maintains low contact resistance on electrical terminals under vibration

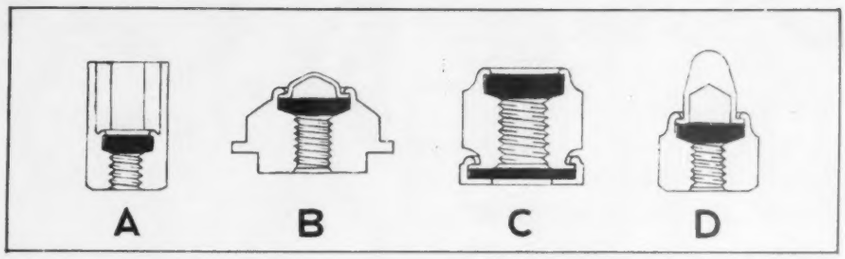


Fig. 13—Special nuts. A is an internal hex nut, B shanked washer face cap nut, C shock washer and nut assembly, D outboard motor propeller cap nut

maintains the original tension under severe vibration. Thus the elastic stop nut is locked to the bolt and not to any support. In addition to automatically locking the nut to the bolt, the fiber presses tightly around the bolt threads sealing them against corrosion or leakage. This type of nut can be removed and replaced many times without losing its locking effectiveness.

Among other advantages of elastic stop nuts are these: It is available in any size, any material, any thread system. The locking collar is non-metallic and will not set up electrolysis with the bolt. The nut can be placed exactly where wanted on a bolt and will not move up or down so precision adjustment is easy. These nuts have full set surfaces square with the bolt. They do not require specially threaded bolts. They have the same thread height as a standard nut as there is no sacrifice of strength to get the locking feature. They are available in size from No. 1-72 up to 6 inches, and of practically any material including brass, bronze, steel, stainless steel, malleable iron, zinc, aluminum and other metals and alloys.

Widely Used in Aircraft

Perhaps the largest application of elastic stop nuts to date is in connection with the aircraft industry where they are widely employed. Chief advantage in this work appears to be the fact that they are foolproof. The locking feature being an integral part of the nut means no extra parts or locking auxiliaries can be forgotten during assembly. A considerable number of them have been employed for ten years in airplanes, demonstrating their dependability. Also, the ability of elastic stop nuts to be used again and again without losing their locking effectiveness is important as it makes possible the riveting of anchor gang channel and clinch types to interior of structures (blind mounted). Metal skin or access plates are held by screws drawn into such nuts. Particularly important when nuts are used with soft bolt material, such as brass or duralumin, is the fact that the locking collar does not cut or weaken bolt threads.

In airplanes, small machine screw sizes of elastic stop nuts are the standard means of fastening instruments to the panels, holding terminal connections on instruments and for assembling radio-beam receivers. Larger sizes, made from steel or aluminum, are standard on brake assemblies, automatic pilots, motor rocker arm cover boxes, pontoon assemblies and other places. In some instruments the elastic stop nut is clinched into lugs on the case to facilitate mounting with bolts screwed in from the front of the panel.

In electrical work elastic stop nuts are of particular value. When the nut is drawn tight, it makes a joint capable of carrying maximum electrical load with minimum resistance. Thread surfaces are cleaned automatically as the nut is applied. Its use avoids electrolytic action caused by contact of metals of different potential and removes the possibility of twisting terminals out of place. Thin terminal types are used for connections, clinch types for assembling thin metal housings and blind mounted anchor nuts hold parts with screws from the outside.

Another field of application expanding rapidly is the use of elastic stop nuts in radio equipment, especially around loud speaker assembly where absence of vibration is extremely important, also on mobile units subject to shock and on rubber cushion mountings where their ability to stay put in any adjusted position is valuable. Assembly of many radio parts is facilitated by the clinch type which provides a thread connection for thin sheet metal and locks the screw as well.

Many Automotive Applications

In the passenger car and motor truck field, elastic stop nuts are widely employed on engine mounts, spring clips, body bolts, driveshaft universals, wheel hubs, electrical connections, windshield wings and steering gear frames. Here they provide not only assurance against loosening under vibration, but permit quick adjustment and speed maintenance due to their ease of "takeup." Of course there are many other fields, such as railroad and oil field equipment, where these nuts also find important applications.

Typical applications of standard and special elastic stop nuts are shown in accompanying diagrams. Fig. 1 illustrates how a standard elastic stop nut is used on spring mounted connections where the nut must stay put or where it is subject to adjustment. Fig. 2 shows how standard elastic stop nuts are used with rubber insulated or cushion mountings where the nut must not work up or down. On electrical

(*Please turn to Page 82*)

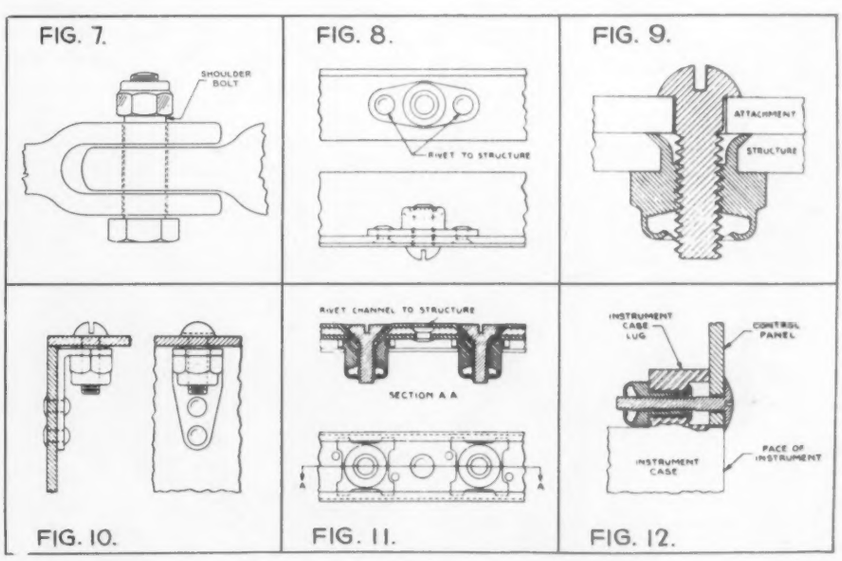
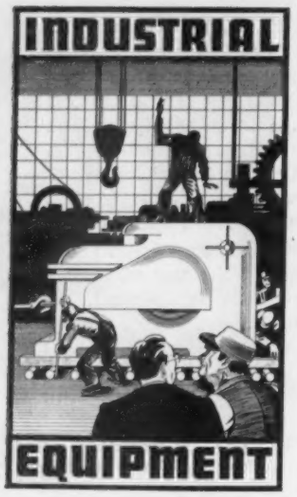


Fig. 7—For bolted connections requiring predetermined play. Fig. 8—Two lug anchor nut for regular blind attachments. Fig. 9—Clinch nut for blind mounting work. Fig. 10—Right angle anchor nut for right angle mounted attachments. Fig. 11—Gang channel for flush blind mounting. Fig. 12—Special nut clinched to lug on instrument case for use in panel mounting



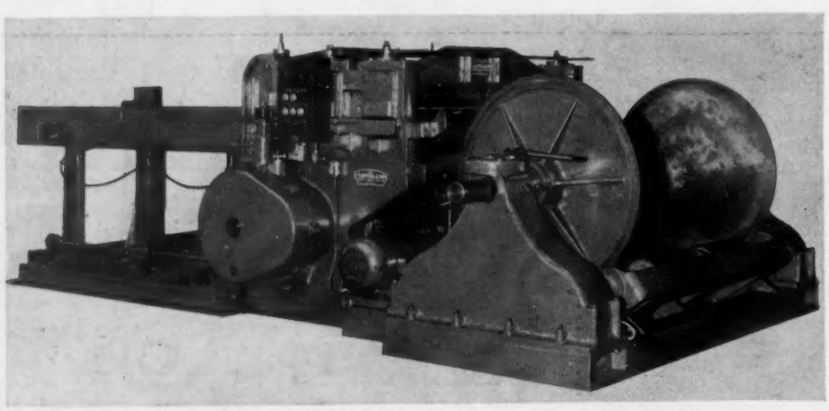
Automatic Shear Handles Wide Range of Coils

■ Cleveland Punch & Shear Works Co., 3917 St. Clair avenue, Cleveland, has introduced an automatic cut-to-length shear, capable of handling stock from 24 to 78 inches in width. Discharge table, located back of the shear, holds sheet in position until cut is made, at which time discharge is tripped and sheet drops into a buggy.

Shear is the down-cut type. Eccentric shaft by which shear is operated is so designed that connections pull down on the slide. Shear is arranged for a speed of 60 strokes per minute, and feed operates at 200 feet per minute. Electrical control consists of a single pushbutton panel with selectors for hand operation, semi-automatic and automatic operation. Feed may be inched either forward or backward. Stacker unit, or runout table, is adjustable to accommodate sheets from 24 to 78 inches in width, and is arranged for a feed of from 6 to 120 inches.

Cradle type uncoiler is so designed that as the coil decreases in size all rollers continue to bear on the outside of the coil, rollers being covered to prevent marring the material. A limit switch prevents this unit from overtraveling the feed.

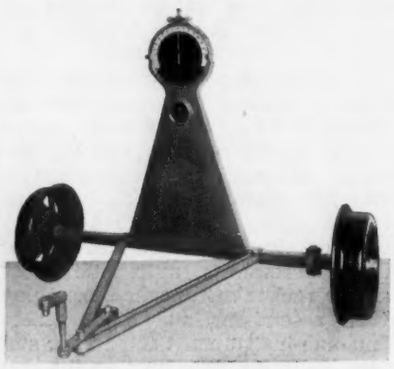
Automatic cut-to-length shear arranged with uncoiler, five-roll leveler and feed rolls



Track Elevation Gage Gives Accurate Reading

■ White Mfg. Co., Elkhart, Ind., has introduced a wheel-mounted gage for measuring super-elevation of railway track on either curve or tangent. Reading is easily visible to inspector on a motor car.

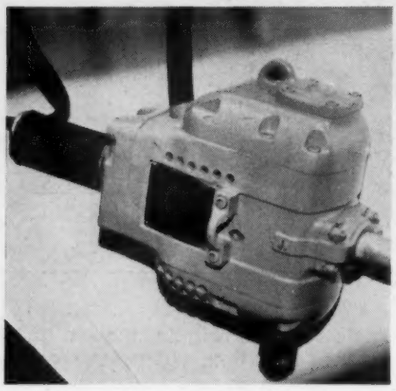
Gage is graduated to show ¼-inch difference in elevation for a total of 8 inches, either high or low. A spirit level shows true horizontal, to which indicator can easily be adjusted. Gage is mounted on a steel pedestal which is fixed to an insulated axle



with standard flanged wheels. Towing device for attachment to motor car is adjustable both vertically and laterally. Total unit weighs 160 pounds.

Nut Runner Streamlined For Added Efficiency

■ Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, has streamlined its Hicycle nut runner into a smooth, well-balanced tool, retaining at the same time the strength and sturdiness essential to this heavy duty, highspeed unit in assembly line applications.



Although it is cast aluminum, with steel inserts for bearing faces of moving parts, this nut-runner has sufficient weight to give it the necessary working balance for easy handling. Features include design of the chuck end for clearance in tight corners, making handle bracket in malleable iron for attachment to the casing, and tying component parts of the tool together by a recessed panel running around the casing. All unnecessary projections have been eliminated. Motor is air-cooled by vent holes on side and at ends of the fluted cap on bottom of tool.

Redesign of this tool was by Designers for Industry Inc., Cleveland.

Device Controls Level Of Material in Hoppers

■ Stephens-Adamson Mfg. Co., Aurora, Ill., recently introduced the Tellevel automatic storage control, a sensitive device designed to control automatically the level of practically any material in bins or hoppers.

Control is accomplished by the device starting or stopping conveyors or elevators feeding the bin. The Tellevel consists of three mercury switches in series, with a sensitive, cast aluminum housing having a Bakelite sphere extending downward. Housing is suspended from above by conduit pipe which permits the device to swing freely as the sphere is contacted by material.

Collapsible Head Bores Automobile Cylinders

■ Wesson Co., 1050 Mt. Elliott avenue, Detroit, has placed on the market a fully automatic collapsible boring head with two or more positive-acting blades. Use of solid tungsten carbide tool bits with this head is said to give maximum life.

In the finish boring of automobile cylinders this boring head is designed to increase accuracy in size,

Have You Seen This HELPFUL LITERATURE?

Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

(1)—Bar Machine

The National Acme Co.—16-page illustrated catalog No. M-39. The Acme-Gridley, model RA, 8 spindle, automatic bar machine, recently announced, is fully illustrated and described. Capacities of 9/16 to 2⅝ inches are handled. Spindle carrier indexing is said to be fast, shockless and time saving. Cross-sectional photos and specifications are covered.

(2)—Pump Castings

Meehanite Metal Corp.—8-page illustrated booklet No. 100. Describes and illustrates various adaptations of Meehanite to pumps faced with severe service requirements. In addition, results of recent cavitation tests on different types of Meehanite are included.

(3)—Induction Motors

Allis-Chalmers Manufacturing Co.—8-page illustrated bulletin No. 1195. "Lo-Maintenance" squirrel cage, induction motors for severe service are fully described. Details of design and construction are shown. A chart of squirrel cage motors and applications is given.

(4)—Valves and Fittings

Alloy Steel Products Co.—34-page illustrated filable folder. Stainless steel valves and fittings for numerous industries where corrosion is common, are presented and fully described. Numerous stainless steel alloys available for "Aloyco" valves are discussed.

(5)—Aluminum Bronze

Ampco Metal, Inc.—Engineering data sheet No. 61. Federal, Navy and Air Corps specifications for aluminum bronzes are outlined, and Ampco Metal's similar grades are set down in adjacent tabular form to show similarity. Availability of Ampco Metal for industrial applications is described.

(6)—Doors

The Kinnear Manufacturing Co.—36-page illustrated catalog No. 23. Fully describes design and operation of steel rolling doors, labeled fire doors, labeled fire shutters, metal rolling grilles, roll-top doors, bifolding doors, door operating equipment and wood rolling partitions. Specifications are given.

(7)—Hydraulic Cylinders

Hannifin Mfg. Co.—16-page illustrated bulletin No. 35-A. Series "N" cylinders, and improved type of high pressure hydraulic cylinders of simplified design and substantial construction, for all classes of hydraulic power applications, are fully described. Dimensions and specifications are given.

(8)—Shop Equipment

Atlas Press Co.—72-page illustrated general catalog No. 39. Full information is given on shapers, drill presses, lathes, vises, machinists tools, wood lathes, motors and grinders, and arbor presses. Newly developed Atlas 10-inch lathes with power cross feed are fully covered.

(9)—Drop Hammers

Chambersburg Engineering Co.—22-page illustrated bulletin No. 255A. Model "E" steam drop hammers are said to produce more forging per blow and more blows per minute; less steam or air requirement; less down-time and lower maintenance; and easier-to-produce, accurate, close-limit forgings. Specifications and details of construction are given.

(10)—Nitriding

The Nitralloy Corp.—29-page illustrated booklet. Nitralloy steels, case hardened in a nitrogenous medium have numerous distinct characteristics. These are described and the process fully illustrated. Advantages of use and characteristics of resulting metals are covered.

(11)—Shear Knives

Braeburn Alloy Steel Corp.—16-page illustrated catalog. In addition to describing all types of shear blades, this catalog has one section devoted to shear blade recommendations which is helpful in selecting the proper blade for various types of work. Typical applications are shown.

(12)—Precision Lathe

South Bend Lathe Works—32-page illustrated catalog No. 46-B. Announces new model 9″ precision lathe. Back-geared, screw cutting metal lathe, in 8 types and different bed lengths is fully described, 38 attachments for all kinds of operations are also covered.

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(13)—Lubricants

E. F. Houghton & Co.—4-page illustrated bulletin No. 2-89. "Sta-Put" heavy duty lubricants for heavy duty machinery, in several available grades is described. These lubricants are specifically designed to handle the unusually difficult lubricating problems inherent in heavy machinery.

(14)—Chain Drives

Link-Belt Co.—47-page illustrated book No. 1645. "Silverstreak" silent chain and roller chain drives for automotive and stationary engines are described in detail. Tables and fully illustrated applications of these two types are shown. Flexible couplings are also covered.

(15)—Alloy Steel Tubing

The Babcock & Wilcox Tube Co.—Technical bulletin No. 6-C. Digest of properties, carbon and alloy steel tubing for high temperature—high pressure service. Complete revision of previous editions. Tables and detailed explanations are included. Separate creep curves for each alloy are given.

(16)—Chain

The Farrell-Cheek Steel Co.—4-page illustrated bulletin No. 20837. A number of typical industrial chain forms, made of "Farrell's 85" cast links are illustrated. Characteristics of this metal for chains are set forth.

(17)—Furnaces

Surface Combustion Corp.—4-page illustrated bulletin No. SC 86. Annealing and hardening with Surface Combustion atmosphere furnaces are fully described. Typical installations and operating data are given.

(18)—Torch Tips

National Torch Tip & Machine Co.—4-page illustrated bulletin. Welding and cutting tips, made of hard-drawn copper rod, and costing up to 35 per cent less than others, are fully pictured and described.

(19)—Lifting Equipment

Rotary Lift Co.—12-page illustrated file folder type bulletin, Form RE-200. Short travel, hydraulic lifting equipment, including "Levelators" (ramp eliminators) and "Tabelators" (elevating work tables), are fully described and pictured in numerous applications. Both units are claimed to reduce production costs.

(20)—Oil Pumps

De Laval Steam Turbine Co.—8-page illustrated catalog No. L-31. De-Laval-Imo oil pumps are intended for handling fuel and crude oils, all grades of lubricating oils and hydraulic oils, are particularly well suited to oil burner and hydraulic pressure service. Construction data and typical applications are covered.

(21)—Controllers

The Foxboro Co.—24-page illustrated bulletin No. 202-2. Potentiometer controllers, designed for governing industrial temperatures in iron and steel making, are fully described. Throttling potentiometer controllers, electric resistance thermometer automatic controllers, and other types of control equipment are also described.

(22)—Abrasive Grain

Abrasive Co. — 4-page illustrated data sheet No. 1, Form ESA59. Descriptive information and specifications of the four types of Borolon (aluminum oxide) abrasive polishing grain for industrial uses are given. Properties and polishing wheel set-up data are covered.

(23)—Alloy Steel

Joseph T. Ryerson & Son, Inc.—Bulletin on "Ry Alloy Steel". This steel was specially developed to meet the demand for an oil hardening steel which, when heat-treated, would develop high hardness and deep penetration, and have minimum distortion and freedom from cracking.

(24)—Milling Attachment

The Cincinnati Milling Machine Co.—4-page illustrated bulletin No. M-803. Specifications of Cincinnati's new high-speed universal milling attachment are given. In addition to the cross range of the machine, this attachment has an additional cross range of 7 inches. Dimensional sketch is shown.

(25)—Salt Bath Furnace

Ajax Electric Co., Inc.—Illustrated folder. Advantages of the Ajax-Hultgren electric salt bath furnace are presented. Entirely new arrangement of immersed electrodes generates heat directly in the bath, producing more uniform product, lower salt cost and longer electrode and pot life.

(26)—Oil Burner

Thermal Processes, Inc.—4-page bulletin on B-500 short flame and B-501 long flame, manual air-adjusting, steam oil burners. Recommended for furnaces requiring a steady, clear flame, and where smoke and obnoxious fumes are undesirable. Description shows principle of operation, and a drawing illustrates construction.

(27)—Motors and Generators

Diehl Manufacturing Co.—25-page illustrated price list and catalog No. 39. Price information and application data on motors, generators, motor-generator sets, ventilating equipment, grinders, etc., with all material arranged for quick reference is included.

(28)—Safety Equipment

Williams and Co.—76-page illustrated catalog No. 200. Industrial safety equipment of all kinds are fully illustrated and described. Centrally located warehouses insure prompt shipment. Completely indexed.

(29)—Long Flame Burners

Bloom Engineering Co.—8-page illustrated bulletin. Long flame burners for steel mill heating, with "soft" flame characteristics are fully described. Principles and advantages are set forth and burners are fully described. Typical installations are shown.

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roundness and straightness, produce a higher quality finish and give greater production due to increased feed made possible by use of the double-point cemented carbide tools. This feature lowers tool wear and eliminates stopping or positioning of spindles and indexing part to prevent scoring of cylinders on return stroke.

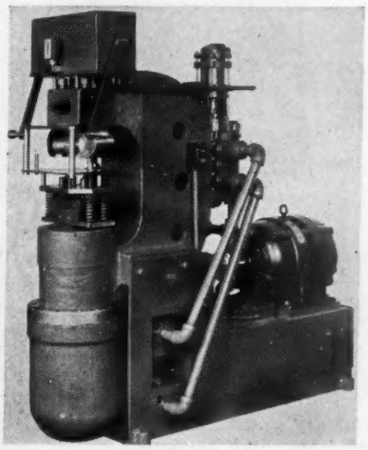
Although this boring head is especially adapted for cylinder boring, it is suitable for finishing holes in sleeves or any hole where precision and high finish are required.

Adjustable Cushion Is Entirely Automatic

■ Hanna Engineering Works, 1765 Elston avenue, Chicago, has developed a cushioning arrangement for air cylinders which can be adjusted to meet variables of air velocity, stroke and relation of cylinder capacity to load.

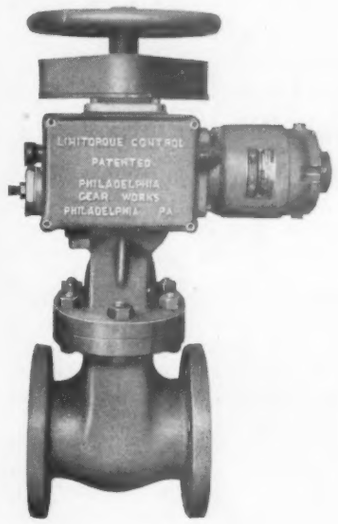
Once adjusted, cushioning is entirely automatic. As cushion sleeve enters cylinder head, air trapped between piston and cylinder head forms a cushion. Thereafter the speed at which piston continues to the end of its stroke is controlled by an adjustable needle valve. A ball check valve assures action of live air upon the full area of the piston when its travel is reversed.

Cylinders embodying this development are available in diameters from 2 to 20 inches. Where heavy loads and long stroke are involved, modifications provide greater cushioning area and stroke. In addition to cushion control, such cylinders are equipped with speed boxes to control full piston travel.



Electric Valve Operator Has Pushbutton Control

■ Philadelphia Gear Works, Erie avenue and G street, Philadelphia, has added to its line the Limitorque Type JS valve operator, consisting of a motor-driven combination helical and worm gear reducing mechanism which bolts to a pad on the side of the valve yoke. Output shaft is connected to the valve stem



or yoke nut through a pair of spur gears.

A lost motion device built into the machine allows motor to attain full speed before stem load is encountered. A "hammer blow" at the valve stem unseats the valve and starts it in motion. Valve can be operated manually by turning the declutch handle. When unit is set for hand operation, handwheel cannot be driven by the motor.

A ¼-horsepower, 110-volt universal motor is supplied as standard equipment with these operators. Pushbutton station has three buttons—"open", "stop" and "close". A green light glows when valve is completely closed, and a red light is on when valve is completely open.

Ammeter Measures High Or Low Current Values

■ Weston Electrical Instrument Corp., Newark, N. J., recently devised and placed on the market the bakelite-encased, alternating current

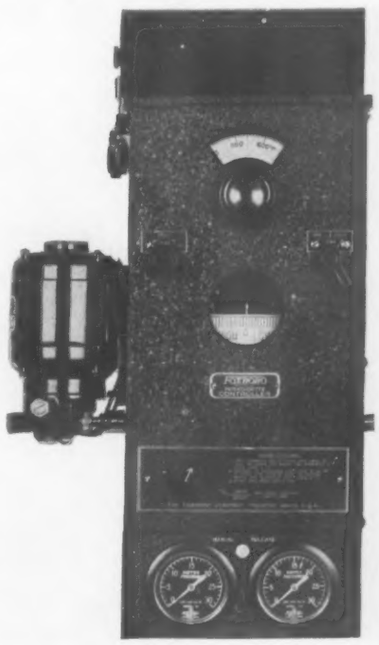
Clamp-Ammeter, which combines six ranges in one instrument and will measure current flow through conductors up to 2¼ inches in diameter.

Actual full scale ranges are 10/, 25/, 50/, 100/, 250/ and 500/ amperes. Any of these ranges may be selected by use of the range changer located at the thumb position. With a single conductor through the clamping jaws, current values from 1 to 500 amperes can be read. Lower ranges may be secured by passing the conductor through the split-core transformer two or more times. Ammeter is designed for use at all commercial frequencies.

Introduces New Type Of Temperature Control

■ Foxboro Co., Foxboro, Mass., has developed a new potentiometer control pyrometer, said to combine the accuracy, responsiveness and wide temperature range of electrical temperature measuring methods with the simplicity, economy and dependability of controlled valves operated by air diaphragm motors.

Designed to actuate air-operated valves which are unaffected by dampness, oily vapors or corrosive



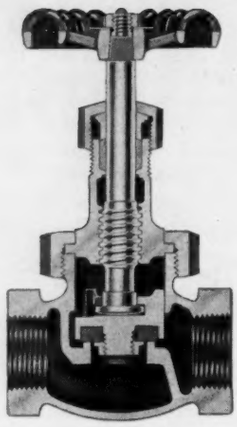
atmospheres and which are free from arcing and sparking electric contacts, these controllers are particularly applicable to gas, oil, steam, hot water and hot air heating, or bring, cold water or air cooling systems.

By means of a fixed setting of the temperature dial and slide wire contact position, mechanism for detecting temperature change acts directly in detecting galvanometer deflection, thus transmitting in control action the full sensitivity of the measuring system. "Knife edge" detecting device can pick up galvanometer deflection of 0.002-inch, representing sometimes as little as 1/3 of 1 degree Fahr. Available ranges are from 300 degrees below to 2800 degrees above zero Fahr.

Union Bonnet Valve Is Sturdily Constructed

■ Ohio Injector Co., Wadsworth, O., has added to its line a new bronze union bonnet valve for 200 pounds working steam pressure at 400 degrees Fahr., 400 pounds water, oil and gas pressure at 150 degrees Fahr. and 600 pounds hydrostatic sheet test pressure at 125 degrees Fahr.

Extra large packing nut, bonnet and sturdily built body are all bronze alloy, A.S.T.M. B-61, tensile 34,000 pounds per square inch. Stuffing box is unusually deep with large packing space, permitting tight joint with minimum pressure on gland. Manganese bronze stem is hard and wear-resisting, and has a tensile strength of 65,000 pounds per



square inch. Composition disk used is said to be excellent for steam, water, air, oil and gas. It is resistant to a large number of common chemicals.

Variable Speed Pulleys Available in Two Sizes

■ Continental Machine Specialties Inc., 1301 Washington avenue, Minneapolis, has revised the design of its line of Speedmaster variable speed pulleys. These pulleys now are moulded of solid, high impact strength bakelite. An improved pressure lubricated bronze sleeve allows the splined center sheave member to operate freely, regardless of load or speed.

Two sizes are available: 3½-inch diameter for drives up to ½-horsepower, and 6½-inch for drives up to 3-horsepower. Pulley is flexible in its adaptability to both straight-line and angular drives. Interposed between motor and driven unit, pulley's position can be changed to vary the center distances of pulley in relation to drive and the driven sheaves. Control of speed is made through a quick action lever or a handwheel allowing control of speed within 1 revolution per minute.

Speeds Up Lubrication Of Heavy Machinery

■ Stewart-Warner Corp., 1826 West Diversey parkway, Chicago, has designed a free-flow giant Alemite button-head fitting for speeding up lubrication of heavy machinery. Bearings requiring large amounts of lubricant, it is said, can be lubricated in less time with less chance of damage due to grease gun equipment through overloading.

In this fitting the usual valve core has been replaced by one which has a flat face and seat, and which when open offers practically no impediment to the free flow of lubricant. By expanding the diameter of the valve retaining spring, lubricant flows unobstructed through the center of the spring and not through its compressed coils.

Body of the fitting is hardened to withstand rough treatment. Its smooth top, which eliminates cutting or wearing of coupling sealing washer, is a new feature.

Welder's Leather Glove Is Specially Tanned

■ Industrial Gloves Co., Danville, Ill., had added a chrome tanned welder's glove to its line of safety clothing. This gauntlet glove, designated as No. 13115, is made with one-piece back extending from knuckles to top edge of the gauntlet, eliminating all seams on back of hand. This construction provides extra leather to protect welder's knuckles, in addition to heavy cotton fleece which lines the entire back of the glove. The unlined palm assures proper "touch" for operator. Specially tanned leather resists shrinkage and hardening.

Tramrail System Handles Output of Two Rod Mills

(*Concluded from Page* 68)

hooks and placed in a special accumulating cradle. When a load of eight to ten bundles has been assembled, the cab operator lowers the hairpin hook, inserts it into the bundles, hoists the load to attain sufficient clearance and carries it to storage, shipping platform or cleaning division, according to instructions on a board within clear view.

On the way, the load first passes over one of three automatic track scales, with printing device and push button control operated from the cab. No ground operator is required at any stage during loading or unloading in any of the bays.

This tramrail system was installed in connection with the new, or No. 2 rod mill, but it also handles the output from the older, No. 1 mill. Rod bundles from the latter are delivered by a separate hook carrier to a point on a tramrail adjacent to the cleaning and baking division. They are removed from the hooks by hand operated lifts, instead of with lifts operated by compressed air as used in No. 2 mill. From this point, however, the procedure is the same as described. The tramrail system is more than adequate to handle the total output of both mills.

♦

Story of Early Ohio Blast Furnaces Told

■ *History of Iron and Steel in Scioto County (Ohio)*, by Frank H. Rowe; cloth, 129 pages, 6 x 9 inches; published by Ohio State Archaeological and Historical Society, Columbus, O.; supplied by STEEL, Cleveland, for $2; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W.1.

This volume is No. 10 in a series by the historical society, designed to obtain as nearly first hand as possible authentic accounts of the early development of the state of Ohio along various lines.

Before the development of present great iron and steel units Ohio ranked high in this field, as shown in the large number of small furnaces built and operated over a wide area. These pioneer plants played a large part in development of the national iron and steel industry.

The author of this volume is supervisor of safety and personnel for the Wheeling Steel Corp. at Portsmouth, O., and has had unusual opportunity for writing this history. It has been approved by Wilber Stout, state geologist, who is a recognized authority on the subject.

In the appendix is a list of charcoal furnaces in Scioto county, analyses of iron ore used in these furnaces and of the pig irons made in them and a chronology. A bibliography of source material is included.

♦

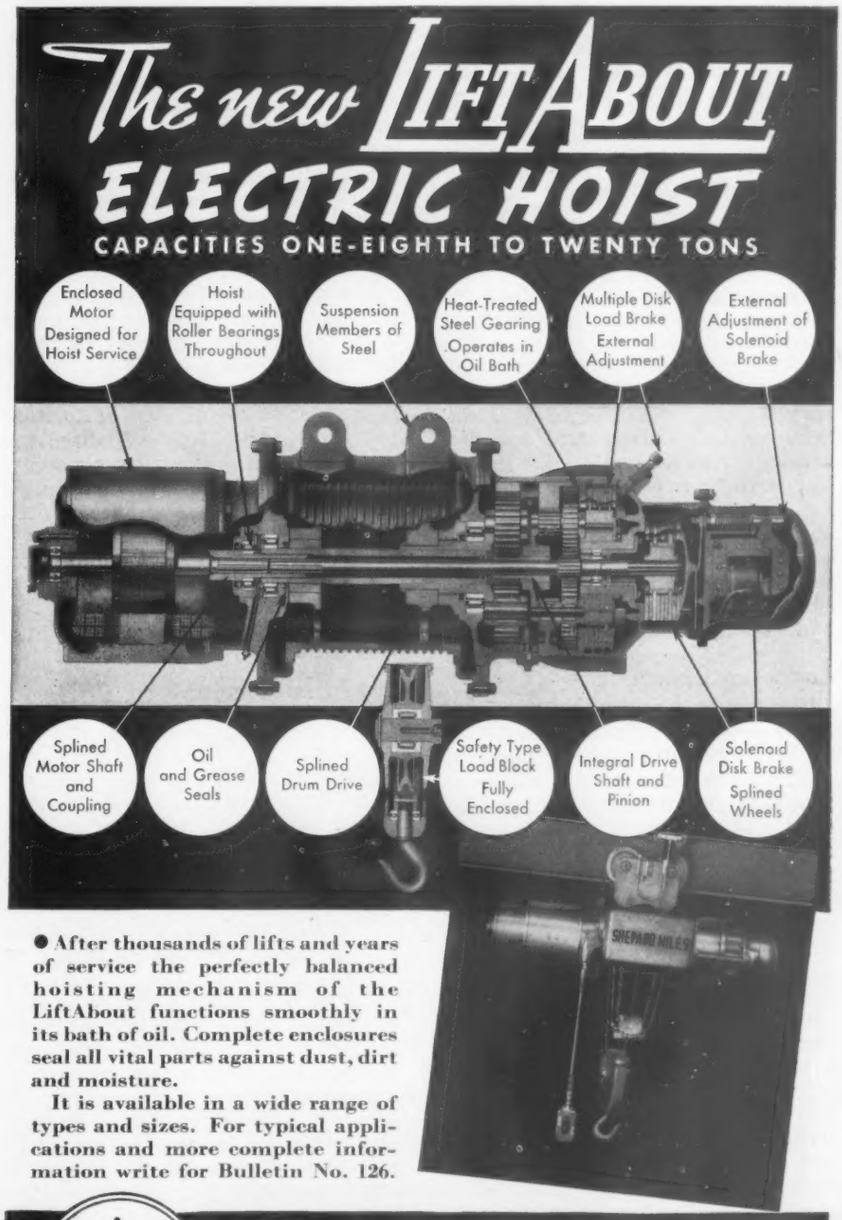
Recommendations for Working Stainless Steel

(*Concluded from Page* 52)

polishing lines—never with a circular motion or across the grain, as light scratches of light and dark areas may result. Remove excessive powder with a clean, wet rag and allow the remainder to dry, as with Bon Ami, and wipe off with a soft, dry cloth—preferably Canton flannel.

The above will be satisfactory for No. 4 and No. 6 finishes. If No. 7 or No. 8 finishes are to be cleaned, do not use the pumice as it will scratch. Use only ammonia and whiting. Better still use only dry whiting.

The double naught (00) pumice, referred to above, can be obtained from any hardware or paint supply house. The whiting can be obtained from the same source. It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Hoist Equipped with Roller Bearings Throughout
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Heat-Treated Steel Gearing Operates in Oil Bath
Multiple Disk Load Brake External Adjustment
External Adjustment of Solenoid Brake
Splined Motor Shaft and Coupling
Oil and Grease Seals
Splined Drum Drive
Safety Type Load Block Fully Enclosed
Integral Drive Shaft and Pinion
Solenoid Disk Brake Splined Wheels
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•

A.S.T.M. to Consolidate Steel Specifications

(*Concluded from Page* 61)

14 grades of material. New requirements for electric resistance welded heat exchanger and condenser tubes and boiler tubes for high-pressure service were drafted and will be submitted to the entire group for approval.

Subcommittee XI on boiler steel, headed by E. J. Edwards, American Locomotive Co., Schenectady, N. Y., decided to consolidate specifications for steel plates of flange and firebox quality (A 89 — 33) with requirements for carbon-steel plates for stationary boilers and other pressure vessels (A 70 — 36). To meet demand for high-tensile boiler rivet specifications, drafting of physical and chemical requirements is being started.

The committee felt the time opportune to attempt consolidating into one specification requirements covering various types of alloy steel plates for pressure vessel and related work. Several separate specifications have been issued covering various types of material. An effort is to be made also to bring together somewhat similar requirements covering high-tensile strength carbon-silicon steel plates for boilers and other pressure vessels (A 149) covering plates 2 inches and under in thickness, and (A 150) covering plates over 2 to 4½ inches inclusive in thickness.

The group working on materials for high-temperature service (A. E. White, University of Michigan, Ann Arbor, Mich., chairman), completed proposed requirements for carbon-steel and alloy-steel welding grade castings. This work has been under way over a year.

Two new grades of alloy steel castings for valves, flanges and fittings for service from 750 to 1100 degrees Fahr. are to be added to the existing specifications (A 157), these covering two types of 2 to 3 per cent chromium steel, one with a 0.5 per cent silicon content, the other with a silicon range of 0.75 to 1.25 per cent, each having minimum tensile strength of 100,000 pounds per square inch and yield point of 65,000 pounds.

An important action of this subcommittee was formation of a new section to concentrate on specification work for welding fittings. J. J. Kanter, Crane Co., Chicago, was named chairman of this group.

The Philadelphia meetings of committee A-1 on steel were held under direction of the chairman, N. L. Mochel, metallurgical engineer, Westinghouse Electric & Mfg. Co., Philadelphia. Another series of meetings will take place during A.S.T.M. committee week in Columbus, O., March 6-10. At this time it is expected several new specifications will be submitted to the main committee.

•

Metallurgical Handbook In Fifty-Fifth Edition

■ *Metallurgie* (metallurgy), by R. Cazaud; fabrikoid, 389 pages, 3¾ x 5¾ inches; published by Dunod, Paris, France; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London S.W. 1.

This is the fifty-fifth edition of a well-known handbook on metallurgy, printed in French. It is divided into seven sections concerned with various phases of metallurgy. The first part deals with general metallurgy, containing information on metallurgical agents, metallurgical furnaces and equipment and processes for electrometallurgy. Part II describes methods of tests for metals, Part III heat treatment and thermochemical treatment. Part IV relates to metallurgy of ferrous materials, and Part V discusses metallurgy of nonferrous products. Parts VI and VII cover metallurgy of precious metals and special metals such as chromium, molybdenum, tungsten, manganese, vanadium, etc.

•

Elastic Stop Nuts Will Handle Variety of Jobs

(*Concluded from Page* 75)

equipment there are many applications similar to that shown in Fig. 3 where an easy, positive, one-nut adjustment is provided by an elastic stop nut on a stud giving accurate adjustment of a contact gap.

Fig. 4 shows how this type of nut can be used where elimination of leakage past stud threads is highly important. Another application somewhat similar to this is shown in Fig. 5 where the stop nut seals bolt or stud threads from corroding elements such as may be encountered in outdoor service. Further protection can be provided by incorporating an end cap as shown in Fig. 13, B and D.

Fig. 6 shows a stop nut holding an electrical terminal lug on a stud where the elastic stop nut assures permanent contact surfaces and provides a full, machine finished contact at the shoulder, thus affording maximum electrical conductivity through the connection and one which will be permanent.

For bolted connections requiring certain amount of predetermined play such as illustrated in Fig. 7, the elastic stop nut also provides excellent service.

For blind mounting of attachments as on many aircraft applications, a 2-lug anchor type of stop nut, as shown in Fig. 8, may be used. In this instance the nut is riveted to the main structure. It also may be spot welded. This same type of nut is constructetd with many variations. For instance the entering side of the nut may be tapered which, with countersunk drilling in the material, permits use of a flat head bolt to produce a fastening flush at the outer surface. In other variations the two anchor lugs are placed 90 degrees apart permitting use of the nut in corners. Also, in some cases one of the anchor lugs may be omitted and the nut fastened simply with one lug.

Clinch Nut for Blind Mounting

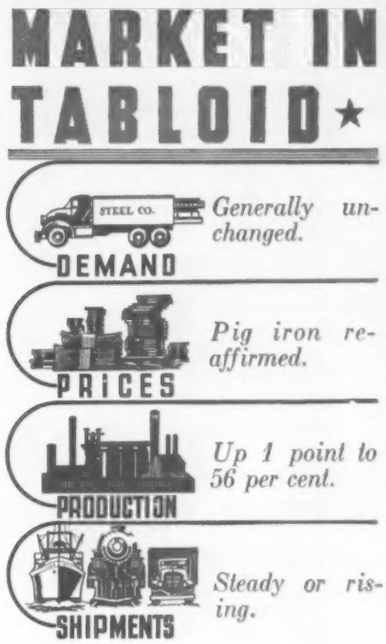
Another variation widely employed is the clinch nut, also for use in blind mounted attachments. This nut and its application is diagramed in Fig. 9. Fig. 10 illustrates another type of nut used with a rightangle anchor, a special design for right-angle-mounted attachments. Although the illustration shows a riveted assembly, the nut anchor may also be fastened to the structure by spot welding. Fig. 11 illustrates the application of gang channel mounting for flush blind assemblies. In this case the elastic stop nuts are made with square head. Formed or raised pin heads maintain the stop nut in correct position along the channel as shown in illustration.

In Fig. 12 is still another type of special stop nut widely used for fastening instrument cases on control panels. Here the elastic stop nut is clinched on a mounting lug of the instrument case in such a position that a bolt from the face of the control panel can be used to lock the instrument in place. Many other types of blind mounted attachments have also been developed.

Fig. 13 illustrates a few of the wide variety of special elastic stop nuts designed for particular application. Item A is a nut with an internal hexagon shape in the upper portion. Item B is a shanked washer face cap nut. It will be noted this unit employs a cap clinched in the top part of the nut to completely cover the end of the bolt. Item D is a special nut developed to lock the propeller of an outboard motor onto the propeller shaft. This also incorporates a cap clinched in the top of the nut to seal the end of the shaft extending through the threads.

March Upturn Seen In Steel Activity

Operations Increase Further; Pig Iron Output Gains



■ STEEL producers are more hopeful concerning prospects for better business the next 60 days.

Finished steel buying lately has shown little change from the slightly reduced pace prevailing during most of February, but consumption is sustained or heavier as reflected in gradual recovery in ingot production. The national steelmaking rate was up 1 point to 56 per cent last week, a new high for 1939 to date and comparing with 29.5 per cent a year ago.

March operations will be aided by heavier rail production. In addition, an upward trend in activity of the automotive, building construction, tin plate and farm equipment industries is indicated, with an accompanying beneficial effect on steel consumption.

Average daily pig iron production in February was 73,543 tons, compared with 70,448 tons in January and 46,655 tons a year ago. Except for November, 1938, this was the highest rate since October, 1937. Active blast furnaces on Feb. 28 numbered 121, a net gain of 3 for the month.

The shorter month reduced total February production to 2,059,203 tons, against 2,183,895 tons in January and 1,306,333 a year ago. Output was the largest for February since 1930, except for 1937, when the total was 3,020,006 tons.

Better Railroad Earnings Enhance Equipment Outlook

Steel requirements of railroads, while still relatively moderate, are becoming an increasingly important factor in total business. Furthermore, recent improvement in earnings of the carriers brightens the outlook for further expansion in orders for equipment and track material.

Latest rail orders include 8500 tons for the Illinois Central, while the Erie is expected to place 21,000 tons, plus 9000 tons of fastenings. Other pending tonnages include 6000 for the Reading and 4000 for the Central of New Jersey. Southern Pacific has awarded 40 steam locomotives, Ford Motor Co. three diesel-electric locomotives, and two steam units have been sold for export. Canadian National has ordered 2000 box cars.

Automobile production rose nearly 5000 units last week to 78,705 cars and trucks. This compares with 54,440 a year ago. General Motors' output increased from 34,765 to 35,255, but Ford cut from 16,600 to 15,400. Chrysler's gain was from 17,060 to 19,835, with all others expanding from 7235 to 8215.

Occasional labor disturbances have occurred at some steel and automotive plants lately. However, these result from dues-collecting attempts or from inter-union differences and give no implications of serious tieups of manufacturing.

Trend In Farm Implement, Tractor Demand Is Upward

Steel needs of farm equipment builders are improving seasonally. Prospects for sales of tractors, implements and merchant wire products are moderately encouraging despite the none too favorable trend of agricultural income.

Further gains in steelmaking at leading centers were responsible for last week's rise in the national average. Pittsburgh operations rose 2 points to 50 per cent, matching the peak attained last fall. Chicago, up 3 points to 56.5 per cent, neared its late-1938 high of 60. Wheeling was up 3 points to 71. Detroit slipped 10 points to 76 per cent on reduced output by Ford. New England also was off 10 points to 60, while Cleveland was down 3 points to 51.

Other districts were unchanged, including eastern Pennsylvania at 37 per cent, Buffalo at 32.5, Birmingham at 83, Cincinnati at 55, Youngstown at 47 and St. Louis at 55.

Some pig iron producers have opened third quarter books at unchanged prices. Delay in announcing finished steel prices for the next period has been without effect on demand. Most consumers and warehouses are holding down stocks, with current needs adjusted closely to mill shipments.

Generally strong tone in scrap markets reflects expectations of further improvement in steelmaking this half. The scrap composite is steady at $14.96, with the finished steel composite holding at $56.50.

COMPOSITE MARKET AVERAGES

	Mar. 4	Feb. 25	Feb. 18	One Month Ago Feb., 1939	Three Months Ago Dec., 1938	One Year Ago Mar., 1938	Five Years Ago Mar., 1934
Iron and Steel	$36.38	$36.38	$36.38	$36.37	$36.36	$38.80	$31.38
Finished Steel	56.50	56.50	56.50	56.50	56.50	61.70	51.10
Steelworks Scrap..	14.96	14.96	14.96	14.87	14.77	13.20	12.30

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 4, 1939	Feb. 1939	Dec. 1938	March 1938
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.75
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.465
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.445
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	2.15	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.20	3.20	3.20	3.45
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	2.15	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.20	3.20	3.20	3.25
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$37.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	March 4, 1939	Feb. 1939	Dec. 1938	March 1938
Bessemer, del. Pittsburgh	$22.34	$22.34	$22.34	$25.26
Basic, Valley	20.50	20.50	20.50	23.50
Basic, eastern, del. Philadelphia	22.34	22.34	22.34	25.34
No. 2 foundry, Pittsburgh	22.21	22.21	22.21	25.21
No. 2 foundry, Chicago	21.00	21.00	21.00	24.00
Southern No. 2, Birmingham	17.38	17.38	17.38	20.38
Southern No. 2, del. Cincinnati	20.89	20.89	20.89	23.89
No. 2X, del. Phila. (differ. av.)	23.215	23.215	23.215	26.215
Malleable, Valley	21.00	21.00	21.00	24.00
Malleable, Chicago	21.00	21.00	21.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.24
Gray forge, del. Pittsburgh	21.17	21.17	21.17	24.17
Ferromanganese, del. Pittsburgh	85.27	85.27	97.77	107.49

Scrap

Heavy melting steel, Pittsburgh	$15.75	$15.65	$15.50	$13.65
Heavy melt. steel, No. 2, E. Pa.	13.25	13.25	13.20	12.75
Heavy melting steel, Chicago	14.25	14.00	13.85	12.20
Rails for rolling, Chicago	17.25	17.25	17.75	15.25
Railroad steel specialties, Chicago	16.25	16.00	16.05	14.25

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.75	$4.25
Connellsville, foundry, ovens	5.00	5.00	5.00	5.25
Chicago, by-product fdry., del.	10.50	10.50	10.50	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	2.15c
Chicago, Gary	2.15c
Cleveland	2.15c
Detroit, del.	2.25c
Buffalo	2.15c
Sparrows Point, Md.	2.15c
New York, del.	2.39c
Philadelphia, del.	2.32c
Granite City, Ill.	2.25c
Middletown, O.	2.15c
Youngstown, O.	2.15c
Birmingham	2.15c
Pacific Coast points	2.65c

Cold Rolled

Pittsburgh	3.20c
Chicago, Gary	3.20c
Buffalo	3.20c
Cleveland	3.20c
Detroit, delivered	3.30c
Philadelphia, del.	3.52c
New York, del.	3.54c
Granite City, Ill.	3.30c
Middletown, O.	3.20c
Youngstown, O.	3.20c
Pacific Coast points	3.80c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown, O.	3.50c
Youngstown, O.	3.50c
Pacific Coast points	4.00c

Black Plate, No. 29 and Lighter

Pittsburgh	3.05c
Chicago, Gary	3.05c
Granite City, Ill.	3.15c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.95c
Pacific Coast	4.65c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.75c	3.35c
Chicago, Gary	2.75c	3.35c
Granite City, Ill.	2.85c	3.45c
Youngstown, O.	2.75c	3.35c
Cleveland	2.75c	3.35c
Middletown, O.	2.75c	3.35c
Pacific Coast	3.35c	3.95c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.00
Granite City, Ill.	5.10

Mfg. Terne Plate (base box)

Pittsburgh, Gary, Chicago	$4.30
Granite City, Ill.	4.40

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New York, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c
Iron	
Chicago, Terre Haute	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c
Reinforcing	
New billet, straight lengths, quoted by distributors	
Chicago, Gary, Buffalo Cleve., Birm., Young., Sparrows Pt., Pitts.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports	2.50c
Philadelphia, del.	2.22c
Rail steel, straight lengths, quoted by distributors	
Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45
(Per pound)	
Polished staples	3.15c
Galv. fence staples	3.40c
Galv. barbed wire, standard 12½ gage two-point hog, 80-rod spool $2.80; two-point cattle, 80-rod spool	$2.62
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00
To Manufacturing Trade	
Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)	
Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

*Delivered.

Alloy Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.80c
Detroit, delivered	2.90c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 150-	
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring flats	0.15
6100 bars	1.20
6100 spring flats	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Electric furnace up 50 cents.

Piling

Pitts., Chgo., Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(*Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons*)

Hot Strip, 12-inch and less	
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, Birmingham	2.15c
Detroit, del.	2.25c
Philadelphia, del.	2.47c
New York, del.	2.51c
Cooperage hoop, Youngs., Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.95c
Chicago	3.05c
Detroit, del.	3.05c
Worcester, Mass.	3.15c

Carbon	Cleve. Pitts.
0.26—0.50	2.95c
0.51—0.75	4.30c
0.76—1.00	6.15c
Over 1.00	8.35c

Worcester, Mass $4 higher.

Commodity Cold-Rolled Strip	
Pitts.-Cleve.-Youngstown	3.10c
Detroit, del.	3.20c
Worcester, Mass.	3.50c

Lamp stock up 10 cents.

Rails, Fastenings

(*Gross Tons*)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Cents per pound	
Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chicago, Birmingham	3.15c
Tie plates, base	2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, carloads 5% up; full containers additional 10%.

Carriage and Machine	
½ x 6 and smaller	65-5-5 off
Do. larger, to 1-in.	60-10-5 off
Do. 1⅛ and larger	60-5-5 off
Tire bolts	50-5 off
Stove Bolts	

In packages with nuts attached 75 off; in packages with nuts separate 75-12½ off; bulk 85 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5-5 off
Elevator bolts	50-10-5-5 off
Plow bolts	65-5-5 off
Nuts	

Semifinished hex.	U.S.S.	S.A.E.
6-inch and less	65-5	70
⅞-1-inch	60-10	65
1⅛ and larger	60-5	60-5

Hexagon Cap Screws	
Milled	50-10 off
Upset, 1-in., smaller	65-10 off
Square Head Set Screws	
Upset, 1-in., smaller	73-10 off
Headless set screws	62-10 off

Rivets, Washers

Structural, Pittsburgh, Cleveland, Chicago	3.40c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers	
and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel In.	Blk.	Galv.
⅛	63½	54
¼	66½	58
1—3	68½	60½
Iron		
¼	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel		
2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54
Iron		
2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel	
1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron	Blk.	Galv.
¾ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	.....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	.....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(*Gross Tons*)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00
Forging Quality Billets	
6 x 6 to 9 x 9-in., base	
Pitts., Chicago, Buffalo	40.00
Duluth	42.00
Sheet Bars	
Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00
Wire Rods	
Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp	
Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens	
Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75
By-Product Foundry	
Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$28.00

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.00	22.50	21.50	23.00
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.87	.....	.....	.....
Boston from Everett, Mass.	23.25	23.75	22.75	24.25
Boston from Buffalo	23.25	23.75	22.75	24.24
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birminghom	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.24	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, base; $27.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del Chicago	28.34
		Lyles, Tenn.	23.50

†Silvery

Jackson county, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo, $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$40.00
Joliet, E. Chicago	49.00
Birmingham, Ala.	40.00

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickest magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $80.00
Do., del. Pittsburgh 85.27

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 88.00
2% carbon, 93.00; 1%, 103.00
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.65-1.70

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.75c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots. 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, any quantity, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do., less-ton lots 8.25c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c
88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, carlots, 2 x ⅛-in., lb. 14.00c
Do, 2% 12.50c
Spot ¼c higher

Silicon Briquetes, contract, carloads freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, bulk freight allowed, lb. 4.50c
Ton lots 5.00c
Less-ton lots 5.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, gross ton $97.50
Do, spot 102.50
34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.61
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.73	4.90	4.50
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.33
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
Detroit	3.43	3.58	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.00	4.15	4.15	3.95	3.95	5.71	3.90	....	5.25
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	3.85	4.65	4.65	3.80	3.80	5.75	4.10	....	4.60
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	3.95	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	3.95	.	5.25
Portland, Oreg.	4.00	4.40	6.10	4.00	4.00	5.50	3.95	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.05
San Francisco	4.05	4.45	6.00	4.00	4.00	5.60	4.00	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.61	4.43	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.39	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.36	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.35	3.95	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.57	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.95	3.80	7.35	5.95	5.70	7.75	8.35	6.95
Cleveland	3.35	4.05	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	3.60	3.58	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.30	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.64	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	4.18	3.93	7.48	6.08	5.85	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.09	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	..	7.80	7.65	8.45	....	....
Portland, Oreg.	....	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.60	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, March 2

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Quoted in dollars at current value	Continental Channe or North Sea ports, gross tons **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$23.45 5 0 0	$17.25	2 0 6
Basic bessemer	....	16.40	1 18 6
Hematite, Phos. .03-.05	26.97 5 15 0*	.....	.....
Billets	$34.59 7 7 6	$38.34	4 10 0
Wire rods, No. 5 gage	53.35 11 7 6	42.60	5 0 0
Standard rails	$44.56 9 10 0	$48.99	5 15 0
Merchant bars	2.30c 11 0 0	1.90c to 2.05c	4 17 6 to 5 5 0
Structural shapes	2.09c 10 0 0	1.90c	4 17 6
Plates, †¼ in. or 5 mm.	2.29c 10 18 9	2.19c to 2.39c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm	2.72c 13 0 0	2.93c	7 10 0*
Sheets, gal., 24 ga., corr.	3.29c 15 15 0	3.42c	9 0 0
Bands and strips	2.77c 13 5 0	1.95c	5 0 0
Plain wire, base	4.08c 19 10 0	2.39c to 2.83c	6 2 6 to 7 5 0
Galvanized wire, base	4.86c 23 5 0	3.07c to 3.17c	7 17 6 to 8 2 6
Wire nails, base	.....	2.73c to 2.93c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.73 1 0 3	.....	.....

British ferromanganese $80.00 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$23.22	4 19 0(a)	$17.44	620.50	$16.18	480	$25.29	63
Basic bess. pig iron	21.69	4 12 6(a)	.....	...	.....	...	27.90(b)	69.50
Furnace coke	5.39	1 4 2	5.96	225	7.25	215	7.63	19
Billets	34.59	7 7 6	25.04	945	28.98	860	38.74	96.50
Standard rails	1.99c	9 10 0	1.56c	1,300	2.06c	1,375	2.38c	132
Merchant bars	2.42c	11 12 0††	1.44c	1,202	1.65c	1,100	1.98c	110
Structural shapes	2.17c	10 8 0††	1.41c	1,173	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm	2.29c	10 19 3††	1.82c	1,515	2.06c	1,375	2.29c	127
Sheets, black	3.08c	14 15 0§	2.17c	1,805‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.61c	17 5 0	3.12c	2,600	4.13c	2,750	6.66c	370
Plain wire	4.08c	19 10 0	1.92c	1,600	2.48c	1,650	3.11c	173
Bands and strips	2.58c	12 7 0††	1.71c	1,340	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed. ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 75 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†12.00
Bos. dock No. 1 exp.	13.00-13.50
New Eng. del. No. 1	14.00
Buffalo, No. 1	13.75-14.25
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	14.00-14.50
Chicago, auto, no alloy	12.50-13.00
Chicago, No. 2 auto	11.50-12.00
Cincinnati, dealers	11.50-12.00
Cleveland, No. 1	13.75-14.25
Cleveland, No. 2	12.75-13.25
Detroit, No. 1	10.00-10.50
Detroit, No. 2	9.00- 9.50
Detroit (industrial)	10.50-11.00
Eastern Pa., No. 1	15.00-15.50
Eastern Pa., No. 2	13.00-13.50
Federal, Ill.	11.75-12.25
Granite City, R. R.	12.25-12.75
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	12.50-13.50
Los Angeles, No. 2	11.00-11.50
N. Y. dock No. 1 exp.	12.00-12.50
Pitts., No. 1 (R. R.)	16.50-17.00
Pittsburgh, No. 1	15.50-16.00
Pittsburgh, No. 2	14.75-15.25
St. Louis, R. R.	12.25-12.75
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	12.00
Seattle, No. 1	12.00
Toronto, dirs. No. 1	9.75-10.25
Valleys, No. 1	14.75-15.25

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	13.00-13.50
Chicago, dealer	12.00-12.50
Cincinnati, del.	11.00-11.50
Cleveland	13.75-14.25
Detroit	11.75-12.25
E. Pa., new mat.	15.50
E. Pa., old mat.	11.00-11.50
Los Angeles	12.50-13.00
Pittsburgh	15.50-16.00
St. Louis	10.00-10.50
Valleys	14.25-14.75

BUNDLED SHEETS

Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Cleveland	10.00-10.50
Los Angeles	14.00
Pittsburgh	14.75-15.25
St. Louis	7.50- 8.00
Toronto, dealers	4.00

SHEET CLIPPINGS, LOOSE

Chicago	9.25- 9.75
Cincinnati, dealers	7.00- 7.50
Detroit	8.50- 9.00
†Los Angeles	3.75- 4.00
St. Louis	7.00- 7.50

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	12.50-13.00
Cincin., No. 1, deal.	8.00- 8.50
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	8.00- 8.50
Detroit, No. 1, new	10.00-10.50
Valleys, new, No. 1	14.00-14.50
Toronto, dealers	4.00

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	7.00- 7.50
Chicago	6.75- 7.25
Cincinnati, dealers	4.75- 5.25
Cleveland	7.50- 8.00
Detroit	5.75- 6.25
Eastern Pa.	9.00- 9.50
Los Angeles	4.50- 5.00
New York	†3.50- 4.00
Pittsburgh	9.50-10.00
St. Louis	3.00- 4.00
Toronto, dealers	4.00- 4.50
Valleys	9.25- 9.75

SHOVELING TURNINGS

Buffalo	7.25- 8.00
Cleveland	7.50- 8.00
Chicago	8.50- 9.00
Detroit	6.50- 7.00
Pitts., alloy-free	11.25-11.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.00- 7.25
Cincinnati, dealers	3.50- 4.00
Cleveland	8.00- 8.50
Eastern Pa.	6.50- 7.00
Detroit	5.75- 6.25
New York	†2.50- 3.00
Pittsburgh	8.25- 8.75
Toronto, dealers	5.00- 5.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	14.00-14.50
East. Pa., elec. fur.	13.00-13.50
St. Louis	9.50-10.00
Toronto	4.00- 4.50

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†6.00- 6.25
Buffalo	7.50- 8.00
Chicago	6.00- 6.50
Cincinnati, dealers	3.50- 4.00
Cleveland	8.00- 8.50
Detroit	5.75- 6.25
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	2.50- 3.00
Toronto, dealers	3.50

RAILROAD SPECIALTIES

Chicago	16.00-16.50

ANGLE BARS—STEEL

Chicago	15.50-16.00
St. Louis	14.00-14.50

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.50-17.00
Chicago, leaf	15.75-16.25
Eastern Pa.	17.00-17.50
Pittsburgh	18.00-18.50
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	16.00-16.50
Chicago (2 ft.)	16.50-17.00
Cincinnati, dealers	16.75-17.25
Detroit	16.50-17.00
Los Angeles	15.00-15.50
Pitts., 3 ft. and less	18.00-18.50
St. Louis, 2 ft. & less	16.25-16.75

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	14.00-14.50
Cleveland	17.00-17.50
Pittsburgh	18.00-18.50
St. Louis	13.75-14.25
Seattle	16.00

FROGS, SWITCHES

Chicago	14.00-14.50
St. Louis, cut	13.75-14.00

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

PIPE AND FLUES

Chicago, net	9.00- 9.50
Cincinnati, dealers	7.25-7.75

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	8.50- 9.00
Cincinnati, dealers	7.00- 7.50
Eastern Pa.	13.00-13.50
New York	†8.50- 9.00
St. Louis	9.00- 9.50

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	10.75-11.25
St. Louis, No. 2	10.00-10.25
Toronto, No. 1 dir.	8.00

FORGE FLASHINGS

Boston district	†8.50
Buffalo	12.00-12.50
Cleveland	12.00-12.50
Detroit	10.00-10.50
Los Angeles	9.00
Pittsburgh	14.50-15.00

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	16.50-17.00

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	17.00-17.50
Pitts., billet, bloom, slab crops	19.00-19.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	16.00-16.50
Eastern Pa.	17.50-18.00
Pittsburgh	17.50-18.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	17.00-17.50
New York	†14.50-15.00
Eastern Pa.	17.00-17.50
St. Louis	16.50-17.00

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†16.00-16.50
Chicago, net	18.00-18.50
Eastern Pa.	21.00-21.50
St. Louis	18.00-18.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	13.50-14.00

SHAFTING

Boston district	†15.25-15.50
New York	†15.50-16.00
Eastern Pa.	20.50-21.00
St. Louis, 1¼-3¾"	17.50-18.00

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	13.50-14.00
Chicago, rolled steel	15.50-16.00
Cincin., iron, deal.	13.50-14.00
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	18.00-18.50
St. Louis, iron	14.50-15.00
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	†13.00-13.50
Boston, No. 1 mach.	†10.50-10.75
N. Eng. del. No. 2	12.00-12.50
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	10.50-11.00
Chicago, auto net	13.00-13.50
Chicago, railr'd net	11.00-11.50
Chicago, mach. net	12.00-12.50
Cincin., mach. deal.	13.50-14.00
Cleveland, mach. net	16.75-17.25
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.50
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.25-15.75
San Francisco, del.	13.50-14.00
Seattle	12.00-14.50
St. Louis, cupola	12.00-12.50
St. Louis, agri. mach.	14.00-14.50
St. L., No. 1 mach.	14.50-15.00
Toronto, No. 1, mach., net	12.00-13.00

HEAVY CAST

Boston dist. break.	†9.75
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break, net	13.00-13.50
Detroit, auto net	13.00-13.50
Detroit, break	9.50-10.00
Eastern Pa.	15.00-15.50
Los Ang., auto, net	13.00-13.50
New York, break	†11.00-11.50
Pittsburgh, break	13.25-13.75

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	8.50- 9.00
Cincinnati, dealers	7.00- 7.50
Detroit, net	8.50- 9.00
Eastern Pa.	13.00-13.50
New York, fdy.	†10.00-10.50
St. Louis	7.50- 8.00
Toronto dealers, net	7.50- 8.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	15.00-15.50
Cincin., agri. deal.	12.00-12.50
Cleveland, rail	15.00-15.50
Eastern Pa., R. R.	15.00-16.50
Los Angeles	17.50-18.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	12.25-12.75

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbes.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbes.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-9.25
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	12.50-13.00
Swedish low phos.	12.50-13.00
Spanish No. Africa basic, 50 to 60% nom.	11.00
Tungsten, sh. ton unit, duty pd. nom.	19.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$23.00-24.00
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	30.00-31.00
So. African, 50-52% nom.	30.00-31.00
Indian, 49-50%	29.00-30.00

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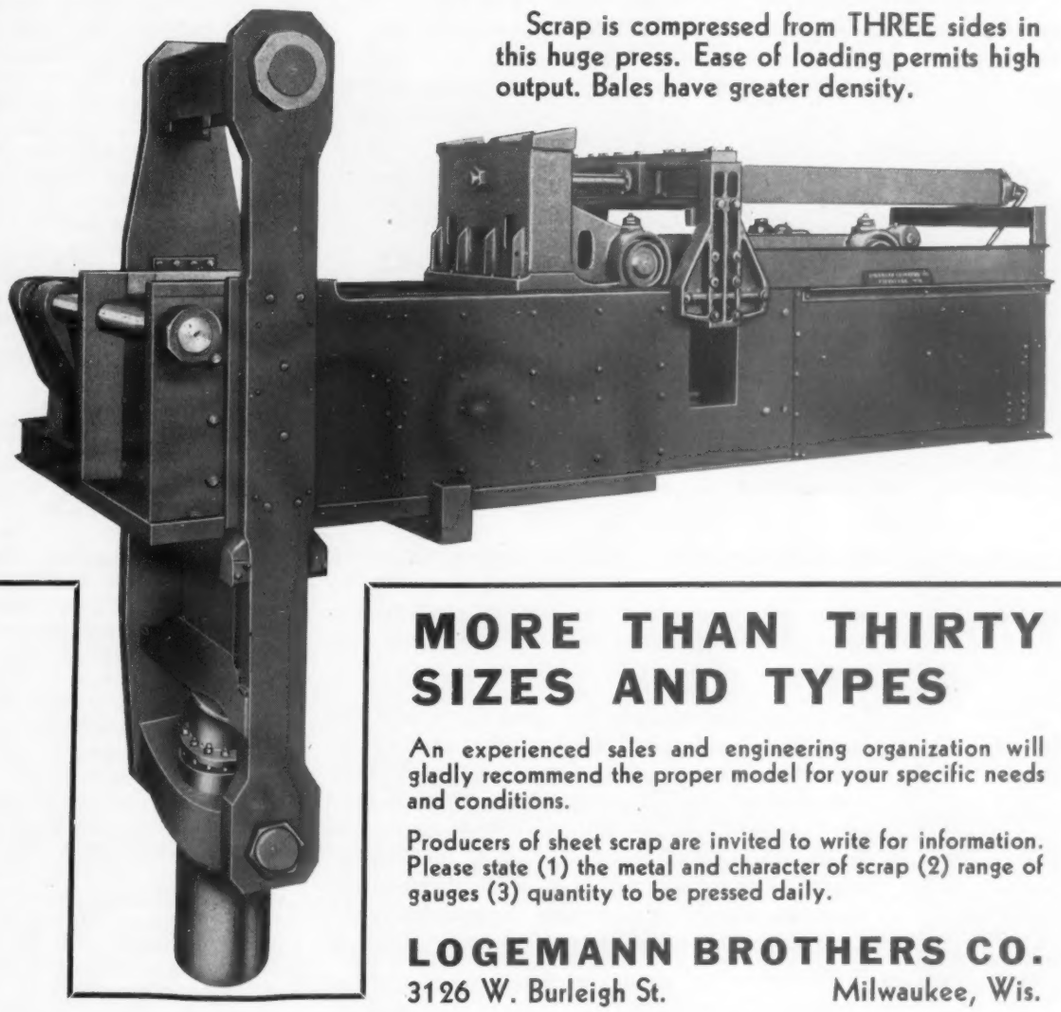

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Producers of sheet scrap are invited to write for information. Please state (1) the metal and character of scrap (2) range of gauges (3) quantity to be pressed daily.

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Sheets, Strip

Sheet and Strip Prices, Pages 84, 85

Pittsburgh—Sheet and strip business is steady and the outlook for better demand good. Recent uncertainty regarding second quarter prices had little effect on orders, although buyers have hesitated to order beyond early needs. Production is gaining slightly, with common and full finished sheet operations slightly above 55 per cent. Galvanized output is up to 60 per cent, extending its rise the past two months to 8 points. Cold strip mills are running 40 to 45 per cent, with hot strip operations about 5 points lower.

Cleveland — A lull in specifications has developed the past few weeks, and this condition is reflected in curtailed finishing mill operations here. However, sellers are confident that an upward trend in demand will materialize this month. The seasonal pickup in activity among the automotive interests is expected to play a leading part in the anticipated improvement the next 30 days. Second quarter price announcement is expected to be made soon. Revisions in the base prices are not expected by sellers here, but most look for an adjustment in the quantity extra and discount list.

Chicago—New business in sheets and strip continues relatively light, chiefly because of scant buying by automotive interests. Farm equipment makers show moderate gains in flat-rolled requirements, while demand from miscellaneous consumers also has gained slightly.

Boston — Sheet buying is barely maintained, despite a few outstanding orders for galvanized, including six carloads placed by a toy manufacturer. In the face of elimination of the $2 functional allowance to jobbers on galvanized, prices quoted by secondary sellers on this grade indicate weakness, although black sheets are steady. Warehouses are purchasing conservatively and miscellaneous demand is more spotty. Small tank fabricators are specifying close to requirements which are light. The largest stove manufacturer in this district continues active and is expected in the market shortly for additional enameling stock. Inquiry for license tag stock is expected from five New England states shortly. Cold strip demand has leveled off, with the bulk of orders coming from miscellaneous consumers. Prices are steady. Hot strip is slow.

New York—Recent reports of second quarter price adjustments have stimulated buying only slightly. Virtual elimination of the jobbers' functional allowance on galvanized sheets has accelerated specifications against contracts which extend through March, however. February sheet bookings were ahead of January, and March is counted on for additional gains. Household appliance makers appear the most active consumers here at present.

Indications that consumption of cold-rolled strip is down slightly are reflected in lighter orders and production. Shipments last month were close to 25 per cent under January. Delay in announcing second quarter strip prices is also attributed to some slack in buying, although in numerous instances producers are booking tonnage for April delivery at current quotations.

Buffalo—February sales of sheets and strip were slightly less than in January but were comparable on a daily basis. Volume was less than expected. Consumers are buying to cover only immediate needs and recently have made no move to anticipate higher prices. Better auto-

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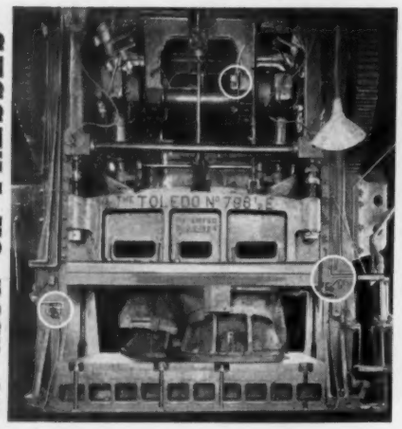

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motive demand is counted on to turn business upward in the near future.

Philadelphia—Automotive specifications are heavier. Galvanized sheet makers report the new sales plan effected recently through elimination of the jobbers' functional discount is working well. It is expected in the wholesale trade that many smaller dealers outlets will be dropped.

Cincinnati—Sheet and strip demand continues within 50 to 60 per cent of rolling capacity. Miscellaneous needs are broad, marked by a moderate upturn in specifications from stove and refrigerator makers.

St. Louis—Expected improvement in sheet specifications has been absent, while new orders have tended to recede. Stove manufacturers are taking smaller lots than three weeks ago, and the farm implement trade is specifying less freely. Galvanized sheets are relatively most active.

Birmingham, Ala—Sheet demand has been holding to its recent level but output of strip has shown little anticipation of renewed activity during first quarter. Manufacturers' and roofing sheets are in best demand.

Plates

Plate Prices, Page 84

Pittsburgh — Plate production is steady, with demand from shipbuilders good. Armor plate production is fairly active. New inquiries for barge building are absent. Floor plate demand is best since 1937, largely because of government construction work.

Cleveland — Award of 1700 tons of 72-inch pipe for Toledo, O., waterworks improvement still is awaited. The same city is asking bids April 18 on 15,000 tons, or 60,000 feet, of 78-inch pipe for another section of this project. Two additional sections will be bid May 2 and 16. Total estimated cost of the work is $9,000,000.

Chicago — Plate demand is heavier, and freight car building and repairs are expected to bring about further improvement. Character of fabricated structural work involves more plates, otherwise sources of business are little changed. Tank requirements still are prominent, while shipbuilding is providing some support to demand.

Boston—Specified work, including standpipes and a filtration plant, account for 1450 tons of plates pending. Standpipes are at Bellingham and Framingham, Mass. Miscellaneous plate demand is slow, although shipyard requirements are steady. Structural and boiler shops are buying little. A fair tonnage of high tensile material has been placed for the Watertown, Mass., arsenal. Some light plate business is appearing for small underground oil storage tanks. Plate prices are subject to shading, $2 a ton being frequent.

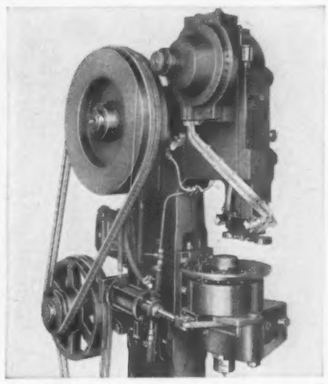
New York — February was disappointing, but plate sellers expect better business this month with structural work becoming more active. Little ship tonnage is being placed, but releases against old orders are fairly heavy. Oil country demand is slow, though considerable work is being contemplated. Plate exporters are benefiting from the recent reduction in ocean rates to Holland.

Philadelphia — Ship specifications still are the backbone of plate demand but apparently are not well distributed. Baldwin Locomotive Works will require about 1000 tons of plates for 28 locomotives booked from Southern Pacific railroad. Demand from the oil industry on the

the RIVITOR

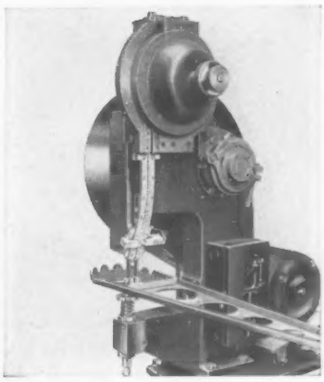
already serves these industries.

AUTOMOTIVE...



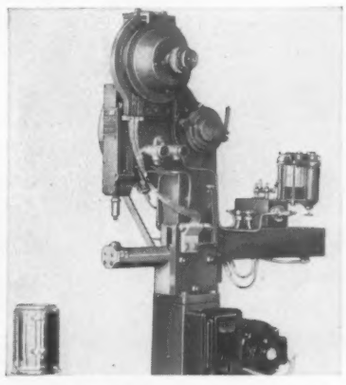
The Rivitor is shown here setting two solid rivets at a time to attach cushion springs to driven clutch plate assemblies.

AIRCRAFT . . . . .



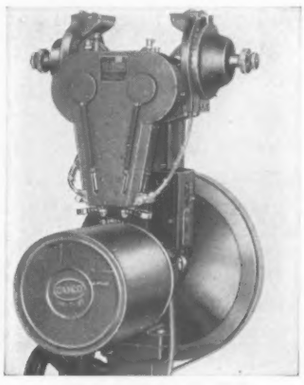
This is the standard "BR" Bench Type Rivitor tooled for setting ⅛" dia. x ¼" long duralumin rivets in airplane sections.

UTENSIL . . . . . .



The Rivitor is shown here setting aluminum rivets to attach handle brackets to bodies of percolators.

CONTAINER . . .



This Rivitor sets two rivets at the same time to attach handle brackets to paint pails.

The Rivitor ably handles not only these jobs in these industries, but many jobs in these and other industries, wherever there are solid rivets to be automatically fed and set to obtain a stronger joint—better—faster.

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This will give you more information on the Rivitor in these industries.

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south and west coasts is slow but prospects for refinery work are regarded bright. Export prices on plates are firmer.

Birmingham, Ala. — Shipbuilding still is expected to furnish the principal impetus to plate manufacturing, and demand has not slackened from the off-season pace that has been maintained since the turn of the year. A better volume is expected with the spring season and further government expenditures.

San Francisco — Inquiries for plates were limited to less than 100 ton lots and less than 100 tons are pending. No award has been made on 400 tons for an elevated tank for Tucson, Ariz. Awards for the year now aggregate 11,448 tons, compared with 11,099 tons for the corresponding period in 1938.

Seattle — United States engineer, Seattle, will open bids March 20 for a light draft steel stern-wheel steamer, 163 feet long, involving about 200 tons plates and shapes, and a steel derrick for removing snags.

Plate Contracts Placed

36,000 tons armor plate, approximately, for navy department; 25 per cent to Carnegie-Illinois Steel Corp., Pittsburgh, 42 per cent to Bethlehem Steel Co., Bethlehem, Pa., 33 per cent to Midvale Co., Nicetown, Pa.

Plate Contracts Pending

2000 tons, 72-inch steel pipe line for waterworks improvement, Toledo, O.; Kalill Co., Cleveland, low bidder on division A, Crumley, Jones & Crumley, Cincinnati, low bidders on division B; same project calls for bids April 18 on 15,000 tons or 60,000 feet of 78-inch steel pipe at estimated $2,090,000, while another section goes in May 2 at estimated $1,138,000, and the last section May 16 at estimated $920,000; total estimated cost $9,000,000.

1000 tons, mostly plates, tank and filter unit, filtration plant, New Britain, Conn.; bids in.

300 tons, standpipe, 120 x 40 feet, Framingham, Mass.

200 tons or more (including shapes), 163-foot stern-wheel snag steamer; bids to United States engineer, Seattle, March 20.

Unstated, pier plates and miscellaneous for Coulee project, spec. 832; bids to Denver, March 13.

150 tons, standpipe, 30 x 100 feet, Bellingham, Mass.; bids March 8.

Bars

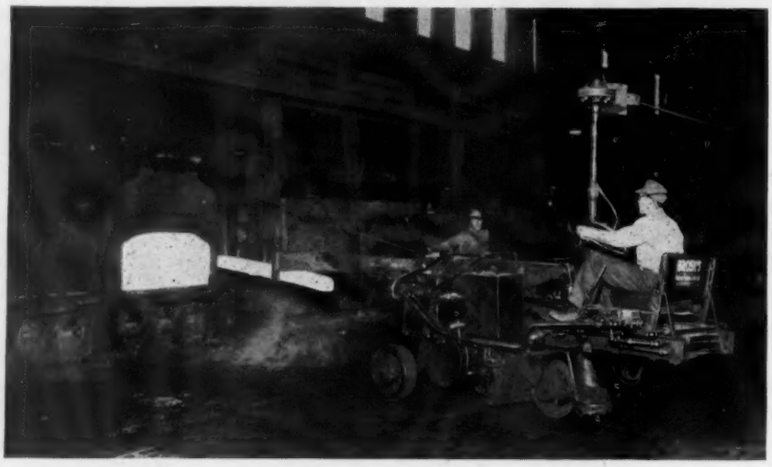
Bar Prices, Page 84

Cleveland — Bar mill operations are little more than holding at the rate of January and early February. Lighter specifications from auto partsmakers contribute to a quieter market. Farm equipment needs are slow in materializing, but the outlook is more encouraging. Machine tool builders are busier, this being reflected in bar requirements.

Chicago—Requirements of agricultural equipment builders are noticeably stronger at some mills and, in a minor way, bars for manufacture of trucks and industrial tractors are in better demand. The general miscellaneous trade is participating well in the merchant bar field, while automotive demand remains a prominent support, particularly in alloy lines.

Boston—Alloy and forging bars continue to make relatively the best showing in buying, with carbon steel material lagging. The machine tool industry and bolt and nut producers are placing some fair-sized alloy business, although the latter are consuming less than was the case several years back. The bulk of volume is being done through jobbers. Cold finished bars are moving in small lots only. For chainmaking, 200 tons of nickel steel stock has been placed for the Boston navy yard.

New York—Commercial bar sellers are expected to open their books



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Auto Floor Manipulators for serving steam hammers, presses, etc.
Soaking Pit Cover Carriages.

Edgar E. BROSIUS, Inc.

Designers and Manufacturers

PITTSBURGH SHARPSBURG BRANCH PA.

European Distributor: Dango & Dienenthal, Siegen, Westphalia, Germany

Brosius Equipment is covered by patents allowed and pending in the United States and Foreign Countries

for second quarter momentarily, with possibly some changes in extras. Meanwhile, buying is fair, with government shops, machine tool builders and airplane manufacturers most active. Noteworthy is some improvement in jobber specifications, resulting from a slight increase in miscellaneous orders received by resellers the past month.

Philadelphia — Demand is fairly steady, with hot alloy and cold drawn specifications relatively more active than low carbon grades. Some replacement buying by warehouses is noted. Prices are steady with the exception of common iron bars which have been offered at 2.10c, delivered here in lots of 1000 pounds or more.

Pipe

Pipe Prices, Page 85

Pittsburgh—Pipe demand generally is steady. Business in oil country goods has improved less than expected. Standard pipe orders are fair although spotty, southeastern markets making the best showing. Automotive releases help to sustain activity in mechanical tubing. Boiler tubes and other pressure tubing remain rather slow.

Cleveland — Standard pipe demand continues seasonally quiet, with shipments from jobbers' stocks showing only slight variation. Better demand for industrial repairs and extensions and residential construction is looked for the next few months. Cast pipe inquiries are lagging, but most foundries have sufficient backlogs to maintain comparatively high operations through March and in some instances through most of April.

Boston—Resale prices for steel pipe are steadier, with a slight improvement noted in demand through secondary sellers. Building requirements account for the mild gain in merchant pipe, with the oil industry placing a few scattered car lots. Cast pipe demand is largely in small lots, but such orders are more numerous. Bellingham, Mass., took the largest tonnage through a contractor. Utilities are placing little tonnage, steel or cast iron.

New York—Resellers of commercial steel pipe had a fairly good month in February, an experience not shared by producers. The latter anticipate better demand from jobbers for restocking during the next 30 to 60 days. The outlook for major building tonnages is regarded as more encouraging.

Cast pipe buying is confined to miscellaneous lots, mostly small. The Brooklyn-Queens circumferen-

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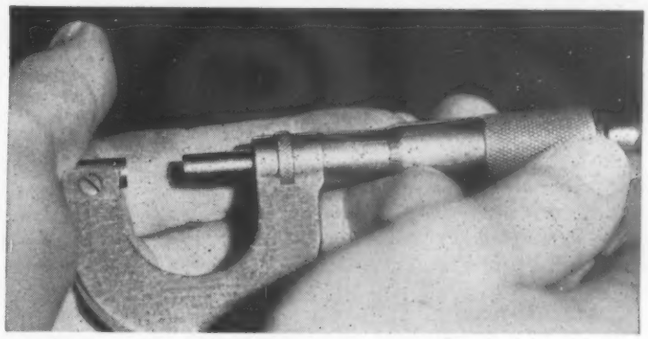
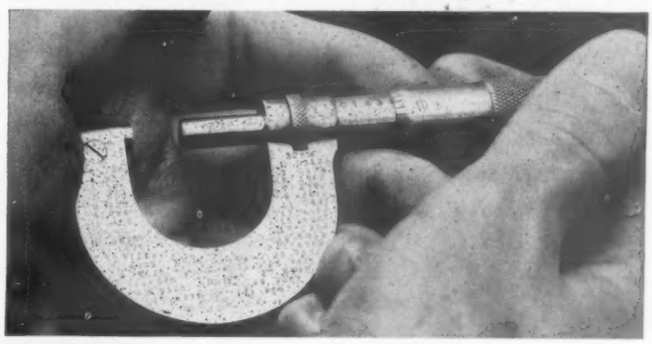


• *Polished surfaces, such as micrometers, scales, etc., require well diffused lighting. Reflected glare from a concentrated light source makes it difficult to read the scale of the micrometer in the upper photo. Compare this with the sharpness of the markings in the lower photo which shows the same micrometer lighted by a large-area source.*



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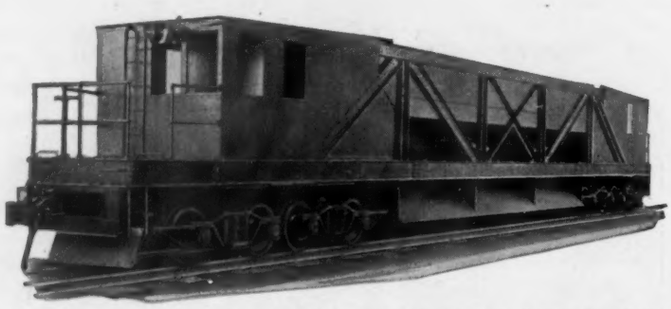
tial highway, is taking several hundred tons from time to time. New York city is expected to buy several thousand tons for yard stocks within a month. Current buying is limited to small miscellaneous lots only. Utilities are taking little. De Liso Construction Co., Jamaica, N. Y., is low on piping for a filtration plant, Springfield, Mass., taking several hundred tons of cast and steel pipe.

Birmingham, Ala. — Demand has been maintained at a fairly consistent level, recent Pacific Coast orders still holding production up to a satisfactory mark. Operations remain, however, on a four-day schedule.

San Francisco — The only cast iron pipe award of size went to Pacific States Cast Iron Pipe Co., 425 tons for St. Charles, Idaho. Inquiries continue to come forth slowly. To date this year 5635 tons have been placed, compared with 4493 tons for the same period a year ago.

Seattle — Inquiry is not active and small tonnages predominate. New projects are developing slowly. H. G. Purcell, Seattle, for United States Pipe & Foundry Co., is low at Portland for furnishing 143 tons of 6 inch cast iron pipe. Lind, Wash., plans water system improvements, aided by approved $4703 WPA grant.

ATLAS ORE TRANSFERS



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THE ATLAS CAR & MFG. CO.

Engineers . . . Manufacturers

CLEVELAND, OHIO

Cast Pipe Placed

425 tons, St. Charles, Idaho, to Pacific States Cast Iron Co., Provo, Utah.

200 tons, 6 and 12-inch, Bellingham, Mass.; to Warren Foundry & Pipe Corp., Everett, Mass.

112 tons 6 and 12-inch, for Washington state WPA, to H. G. Purcell, Seattle, for United States Pipe & Foundry Co., Burlington, N. J. and Universal Pipe Co.

Cast Pipe Pending

400 tons, 24 and 30-inch, filtration plant, New Britain, Conn.; bids in.

368 tons, Mesa, Ariz.; United States Pipe & Foundry Co., Burlington, N. J., low.

143 tons, 6 inch, for Portland, Oreg.; United States Pipe & Foundry Co., Burlington, N. J., low.

100 tons, miscellaneous pipe and fittings, New Haven, Conn.; bids March 10.

Unstated tonnage, water line, Cuyahoga Falls, O., to J. B. Clow & Sons Co., Cleveland.

Unstated tonnage, sewage disposal plant, Celina, O.; bids in.

Unstated tonnage, pipe line, Hubbard, O.; bids March 6.

Unstated tonnage, pipe lines, Western Star, O.; estimated cost $26,500.

Unstated tonnage, pipe lines, Oakharbor, O.; estimated cost $130,000.

Unstated tonnage, waterworks, Orrville, O.; bids in.

Rails, Cars

Track Material Prices, Page 85

Buying of rails seems to have been completed by most carriers, though the inquiry by New York Central contains a fairly large tonnage. Illinois Central has just bought 8500 tons from Chicago mills.

Southern Pacific has placed 28 oil-burning locomotives with Baldwin Locomotive Works, Philadelphia, and 12 coal-burning with Lima Locomotive Works, Lima, O. Bangor & Aroostook has placed 80,000 tie plates with Bethlehem Steel Co. Maine Central will open bids about March 16 on 300 gondolas.

Refusal of a United States circuit court to grant an injunction against the interstate commerce commission's order that fast freight and passenger locomotives be equipped with stokers, over a period of five years, opens a large market for steel and iron used in their construction. Appeal to the Supreme Court may delay final effective date.

Class 1 railroads had 6637 freight cars on order Feb. 1, compared with

5080 Jan. 1, and 6563 Feb. 1, 1938. Steam locomotives on order Feb. 1 numbered 25, compared with 30 Jan. 1 and 110 Feb. 1, 1938. Electric and diesel locomotives on order Feb. 1 were 59, compared with 41 Jan. 1 and 21 Feb. 1, 1938.

Domestic freight car awards in February totaled 2259 units, compared with three in January. The largest lot last month was 2000 cars for the Union Pacific, to be built in its own shops. Comparisons follow:

	1939	1938	1937	1936
Jan.	3	25	17,806	2,050
Feb.	2,259	109	4,972	6,900
2 mos.	2,262	134	22,778	8,950
March		680	8,155	632
April		15	9,772	4,427
May		6,014	4,732	8,900
June		1,178	548	5,200
July		0	1,030	7,229
Aug.		182	1,475	225
Sept.		1,750	1,216	1,750
Oct.		2,537	1,355	2,210
Nov.		1,232	275	1,550
Dec.		2,581	275	23,450
Total		16,303	51,611	64,523

Car Orders Placed

Canadian National, 2000 box cars; 725 to National Steel Car Corp., Montreal, 650 to Canadian Car & Foundry Co., Montreal, 625 to Eastern Car Co. Ltd., New Glasgow, N. S.

Locomotives Placed

Ferrocarril de Antioquia, Colombia, two 2-8-2 steam locomotives, to Baldwin Locomotive Works, Philadelphia.

Ford Motor Co., Detroit, three 1000-horsepower diesel-electric locomotives, each with two 500-horsepower motors, to General Electric Co., Schenectady, N. Y.

Southern Pacific, 40 locomotives; 28 to Baldwin Locomotive Works, Philadelphia, 12 to Lima Locomotive Works, Lima, O.

Rail Orders Placed

Illinois Central, 8500 tons; 4500 tons to Carnegie-Illinois Steel Corp., Chicago, 4000 tons to Inland Steel Co., Chicago.

Car Orders Pending

Maine Central, 150 forty-ton low-side gondolas, 150 forty-ton drop-bottom gondolas; bids about March 15.

Missouri Pacific, 12 miscellaneous coaches, including two mail-storage cars, two mail-baggage, two day-passenger coaches, two deluxe coaches, two diner-baggage-lounge and two parlor-observation cars.

Wabash, 35 cabooses; bids asked.

Locomotives Pending

Royal State Railways, Siam, several diesel-electric motors, bids June 1; specifications available through Messrs. Sandberg, 25 Broadway, New York.

Wabash, four 600-horsepower diesel locomotives; bids asked.

Rail Orders Pending

Erie, 21,000 tons rails, 9000 tons of fastenings; expected to be placed in March.

Reading Co., 6000 tons, and Central of New Jersey railroad, its affiliate, 4000 tons; bids asked.

ACCURACY

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Strictly speaking profits pay dividends. But sales are necessary to make profits and a satisfactory product is essential to continuing sales.

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The foregoing figures are difficult to visualize, but because the grinding machinery manufacturer and the automotive manufacturer work to them your automobile engine operates quieter, smoother and more economically. This assures continuing sales, profits and dividends for its maker. Is accuracy working for you?

284

LANDIS TOOL CO.
WAYNESBORO. PENNA.

Wire

Wire Prices, Page 85

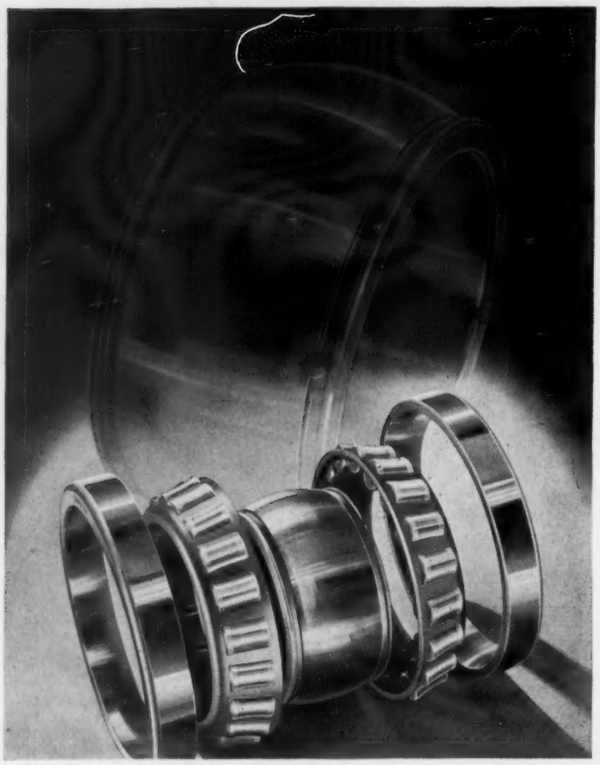
Pittsburgh—Business in wire and wire products is fairly well sustained but is not expected to reach satisfactory volume until heavier spring buying appears. Prices are steady, even on some of the traditionally weak merchant items. Secondary markets are quiet, but inquiry is fairly active. Inquiry for manufacturers' wire also is better. Jobber buying has yet to improve materially, but stocks are low and indications point to an upward trend in ordering.

Cleveland — Manufacturers' wire specifications are fairly steady at the somewhat lower levels prevailing the last few weeks. The decline resulted principally from curtailed needs of automotive suppliers, a situation expected to be reversed later this month. Specifications for merchant products from farm districts are slower than expected but are due for seasonal expansion. In keeping with the recent separation of barbed wire prices from the wire nail base, all merchant items now are quoted on separate cards.

Boston—Demand for wire is more spotty, with aggregate tonnage about maintained. There is little advance buying, the bulk of orders being for prompt delivery. Industrial consumption appears to be holding, but the upturn in consumption has been less than expected.

New York — Wire orders have slipped slightly, with forward buying lacking. Finishing operations in the East are also down, 60 per cent being tops in most departments. A few specialties are exceptions. Spring wire buying by the furniture trade has improved, but less than expected. Screw stock and manufacturers' wire demand is unchanged, consumers ordering frequently in small lots. Prices are fairly steady with the exception of some electrical goods entering into building construction.

Birmingham, Ala. — Wire production continues at about 75 per cent of capacity, with demand consistent although shipments are not in large quantities.



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SELF-ALIGNING ROLLER BEARINGS

Weirton Will Broaden Range of Structurals

■ Weirton Steel Co., Weirton, W. Va., announces that about July 1 it will expand its line of products to include a more complete range of structural shapes. Additional sections, to be announced later, will be available at that time and others will be added as rapidly as time will permit.

Present limits of production are angles 1 x 1 inch to and including 8 x 8 inches; standard channels and beams not exceeding 12 inches. These items are regularly carried in stock for prompt shipment.

Range of I beams will be increased to include 24-inch and wide flange beams to include 21-inch.

Shapes

Structural Shape Prices, Page 84

New York—Two contracts covering sections of the Delaware aqueduct, New York, and taking close to 10,000 tons of structural material, mostly tunnel supports overshadow other pending inquiry. Awards, which are light, include 2000 tons for the Triborough hospital, Queens, placed through the Karl Koch Erecting Co., New York.

Fabricated structural bookings during January of 101,559 tons rep-

resented a substantial gain over the 80,320 tons placed in the comparable month last year, but were not equal to either November or December of 1938, according to the American Institute of Steel Construction, New York. Shipments amounted to 91,141 tons in January also exceeding the comparable month last year of 87,763. Backlog of orders at the end of January totaled 479,554 tons, against 338,119 tons a year ago.

Pittsburgh — Shape contracts increased last week. Many public works projects are coming out for bids. Private jobs account for about one-third of the new tonnages.

Cleveland — New inquiries continue to come out in increasing volume, particularly from public sources, as work from private interests remains restricted. However, fabricators look for some pick-up in work of this nature during March. American Bridge Co., Pittsburgh, booked 300 tons for a city hall at Youngstown, O., and Burger Iron Works, Akron, O., has been awarded 540 tons for the Kent University building, Kent, O. R. C. Mahon Co., Detroit, is low on the 1600 tons of fabricated steel for the easterly extension to the Main street bridge here. Considerable tonnage involved in a number of bridge projects are expected to come up for bids during the next 30 days. Fabricated prices remain weak.

Chicago—City council has approved award of a $2,094,766 contract to John Marsch Inc., Chicago, for construction of the fourth section of the Chicago subway. Some 2750 tons of concrete reinforcing steel bars, 450 tons of structural steel, and an unestimated tonnage of steel liner plates and beam ribs are involved. Purchase of the steel is not expected immediately.

Boston—Structural contracts are up slightly, led by 1800 tons for the Portsmouth, N. H., navy yard. Inquiry, however, has picked up at a better pace, new work calling for close to 5000 tons, including two navy yard shops and a Cambridge, Mass., bridge. Bridge requirements are limited largely to small I-beam spans. District fabricating shops have small backlogs. Fabricated structural steel prices continue soft.

Buffalo—Major interest is centered in the pending announcements on contracts for the many school projects on which bids have either gone in, or are due in the next few days. New life was injected into the private construction field with bids expected to be opened soon on several new buildings of small size, calling for a total tonnage of approximately 800 tons, to be built by Great Lakes Coal & Coke company at Niagara Falls, N. Y.

St. Louis — Aside from a new postoffice garage for St. Louis, requiring 340 tons, nothing of moment is before fabricators here. Indications are for improvement soon, due to expected public works awards.

Philadelphia — American Bridge Co., Pittsburgh, has booked a substantial tonnage for the Glen Martin aircraft plant, Baltimore, which is understood for rush shipment. Fair amount of private work is pend-

Shape Awards Compared

	Tons
Week ended March 4	19,602
Week ended Feb. 25	27,602
Week ended Feb. 18	9,961
This week, 1938	9,403
Weekly average, year, 1938	21,566
Weekly average, 1939	27,331
Weekly average, February	17,123
Total to date, 1938	121,977
Total to date, 1939	218,644

Includes awards of 100 tons or more.

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ing, but public projects are temporarily inactive. Dates for bids are expected shortly on the St. George Delaware bridge, requiring over 5000 tons of shapes.

San Francisco — Only two awards of over 100 tons are reported placed. Judson-Pacific Co. booked 1100 tons for three power plants for Pacific Gas & Electric Co. at Martinez, Avon and Oleum, Calif. Bethlehem Steel Co. took 832 tons for a crossing near Turloc, Stanislaus county, California. Awards totaled 2336 tons and brought the year's aggregate to 27,105 tons, compared with 10,147 tons for the same period last year.

Seattle — New business is slow and fabricating shops are nearing completion of jobs in hand. About 2500 tons remains to be placed for the Lake Washington pontoon bridge, Seattle. Port of Seattle will open bids March 6 for two warehouses, for which Columbia Steel Co. will furnish 460 tons of shapes.

Shape Contracts Placed

2000 tons, Triborough hospital, Queens, N. Y., to Fort Pitt Bridge Works, Pittsburgh; through John Kennedy & Co., New York.

1800 tons, ship ways, navy yard, Portsmouth, N. H., to Bethlehem Steel Co., Bethlehem, Pa.

1500 tons, pier shed No. 64, Hudson River, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through procurement division treasury department, New York.

1100 tons, three power houses for Pacific Gas & Electric Co., at Avon, Martinez and Oleum, Calif., to Judson-Pacific Co., San Francisco.

1060 tons, bridge 859, Norfolk & Western, Maybeury, W. Va., to Virginia Bridge Co., Roanoke, Va.

1000 tons, steel sheet piling, East River drive, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through A. M. Hazel Inc., New York.

832 tons, over-crossing near Turlock, Stanislaus county, California, to Bethlehem Steel Co., San Francisco.

600 tons, state overcrossing, Albany, Oreg., to unstated fabricator; Mountain States Construction Co., Eugene, Oreg., general contractor.

590 tons, bridge ERP-7, Collingsworth county, Texas, to Illinois Steel Bridge Co., Jacksonville, Ill.

580 tons, bridge FAGM-77-A, Gregg county, Texas, to Virginia Bridge Co., Roanoke, Va.

575 tons, manufacturing buildings, Agar Mfg. Corp., Kansas City, Mo., to Kansas City Structural Steel Co., Kansas City, Kans.

550 tons, press girders for press shop addition, Grand Rapids Stamping division, General Motors, Grand Rapids, Mich., to American Bridge Co., Pittsburgh.

540 tons, McGilvrey hall, Kent State University, Kent, O., to Burger Iron Works, Akron, O.; through Carmichael Construction Co., Akron.

510 tons, central heating plant, Housing project, Bronx, N. Y., to Ingalls Iron Works, Birmingham, Ala.; through Starrett Bros. & Eken Co., New York.

500 tons or more, 50-ton jib crane for Puget Sound navy yard to Star Iron & Steel Co., Tacoma.

460 tons, barracks and training school, New London, Conn., submarine base, to Lehigh Structural Steel Co., Allentown, Pa.; Turner Construction Co., New York, general contractor.

460 tons, Colonial Court apartments, Bronxville, N. Y., to Grand Iron Works Inc., Bronx, New York city.

450 tons, additions, state hospital buildings, Middletown, Conn., to American Bridge Co., Pittsburgh; through O'Driscoll & Grove Co., Brooklyn, N. Y.

400 tons, approach spans, bridge, Portsmouth, N. H.-Kittery, Me., to Bethlehem Steel Co., Bethlehem, Pa.

390 tons, junior and senior high school, Cato, N. Y., to the R. S. McMannus Steel Construction Co. Inc., Buffalo.

385 tons, laundry, 514 West Forty-ninth street, New York, to Bethlehem Steel Co., Bethlehem, Pa.

385 tons, bridge 1863, Caddo parish, Louisiana, to Jones & Laughlin Steel Corp., Pittsburgh.

360 tons, train sheds, Union Pacific railway, Council Bluffs, Iowa, to Paxton & Vierling Iron Works, Omaha, Nebr.

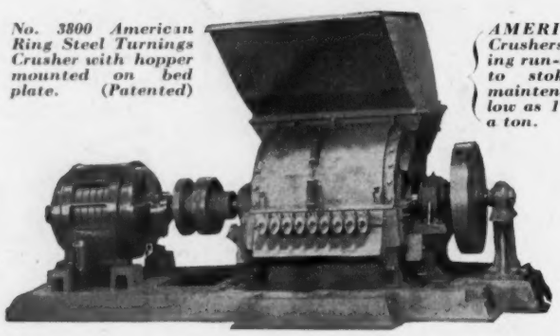
300 tons, steel sheet piling, sewage disposal plant, Bowery Bay, Queens, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; through Tully & Dinapoli Inc., New York.

300 tons, city hall, Youngstown, O., to American Bridge Co., Pittsburgh, Newton Falls, O.

275 tons, building, Lever Bros., Baltimore, to Belmont Iron Works, Eddystone; Pa.; Stone & Webster Co., Boston, contractor and engineer.

260 tons, aquacade roof, Billy Rose Enterprises, Flushing, N. Y., to Belmont Iron Works, Philadelphia.

No. 3800 American Ring Steel Turnings Crusher with hopper mounted on bed plate. (Patented)



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225 tons, physical science building, Indiana university, Bloomington, Ind., to Bedford Foundry & Machine Co., Bedford, Ind.

200 tons, Bascule bridge, Quogue, N. Y., to Fort Pitt Bridge Works, Pittsburgh; through E. L. North, general contractor.

195 tons, tanks, Gulf Oil Corp., Port Arthur, Texas, to Wyatt Metal & Boilers Works, Houston, Tex.

175 tons, high school, board of education, Brighton, N. Y., to Leach Steel Corp., Rochester, N. Y.

170 tons, municipal auditorium, Barre, Vt., to American Bridge Co., Pittsburgh.

140 tons, building, Industrial Silica Co., Phalanx, O., to Ohio Structural Steel Co., Newton Falls, O.

135 tons, storage building, American Brake Shoe & Foundry Co., Mahwah, N. J., to Ingalls Iron Works, Birmingham, Ala.; through Austin Co., New York.

100 tons, bridge, Machias, Me., to American Bridge Co,. Pittsburgh.

100 tons, auditorium, Zanesville, O., to Truscon Steel Co., Youngstown, O.

Unstated tonnage, liner plates and beam ribs for third section, Chicago subway, to Commercial Shearing & Stamping Co., Youngstown, by Michael Pontarelli Inc., Chicago, general contractor.

Shape Contracts Pending

7000 tons, Rondout-West Branch tunnel, Delaware aqueduct, Newburgh, N. Y., for city of New York.

3605 tons, mostly structural steel tunnel supports, contract 316, Delaware aqueduct, Ulster county, New York; bids March 14, board of water supply, New York.

2600 tons, five highway bridges, state of Texas; bids in.

2200 tons, pier shed, pier No. 64, North river, U. S. treasury department, New York.

1600 tons, easterly extension to Main street bridge, Cleveland; National Engineering & Construction Co., Cleveland, low; R. C. Mahon Co., Detroit, low on structural material.

1500 tons, pipe shop, navy yard, Portsmouth, N. H.

1500 tons, shop building, navy yard, Boston.

1500 tons, steel sheet piling, flood wall, Springfield, Mass.; bids in.

1225 tons, tunnel ribs, sewer, Everett-Chelsea, Mass.

1000 tons, auditorium, State college, East Lansing, Mich.

1000 tons, overpass, Boston Metropolitan district commission, Cambridge, Mass.

800 tons, several small new buildings, Great Lakes Coal & Coke Co., Niagara Falls, N. Y.

800 tons, addition to manufacturing building, Firestone Steel Products Co., Riverview, Mich.

800 tons, additions to building, Horn & Hardart Baking Co., Philadelphia.

550 tons, trash rack metalwork, Marshall Ford dam, bureau of reclamation, Rutledge, Tex.

550 tons, central heating plant, Metropolitan Life Insurance Co., New York.

550 tons, addition, Cambridge High and Latin school; readvertised March 7.

500 tons, General Motors building, Grand Rapids, Mich.

450 tons, East End high school, Huntington, W. Va.

400 tons, sports auditorium, Crescent Auditorium Co., Camden, N. J.

400 tons, alterations to Elks club, Brooklyn, N. Y., for city of New York.

400 tons, hospital building, Rome, N. Y., for city.

375 tons, trusses for supporting plates, bureau of mines, Grand Coulee dam, Washington.

340 tons, postoffice garage, St. Louis; J. S. Alberici, St. Louis, low on general contract.

307 tons, over-crossing of Southern Pacific Co. tracks, University avenue, Berkeley, Calif.; bids opened.

300 tons, Albany street grade crossing over Boston & Albany railroad; bids March 14.

300 tons, subway, State street, Chicago, contract S-6.

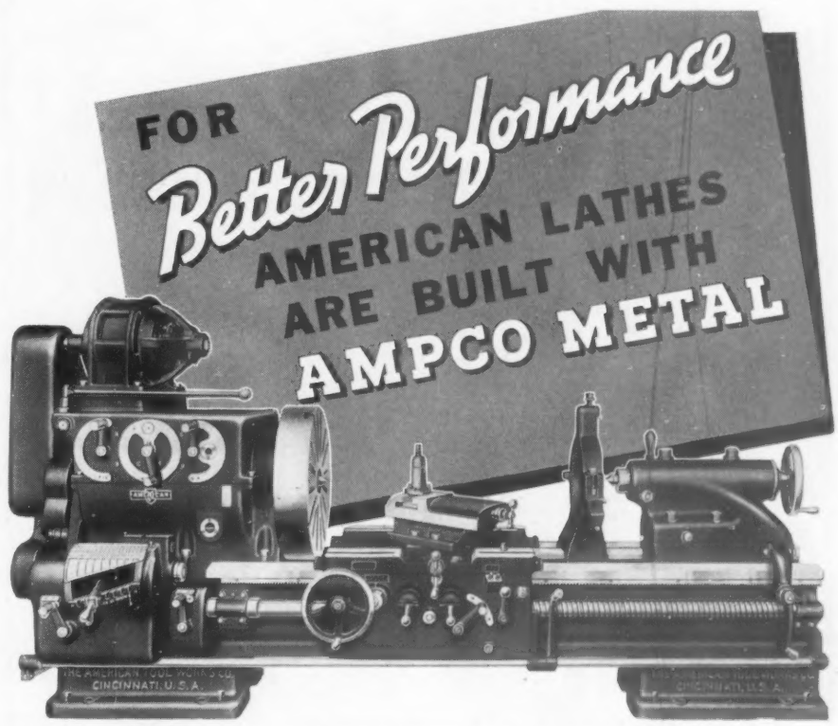
300 tons, saddles for pipe line, Utah Power & Light Co., Grace, Idaho.

300 tons, addition to post office and court house, Los Angeles.

257 tons, bridge and approaches taking Princeton-Hightstown road over Pennsylvania railroad, Princeton Junction, N. J., bids March 15, Trenton, N. J. Bridge will be through plate girder, 102 feet long, width 52 feet with two 6-foot sidewalks; 95,100 pounds, reinforcing steel.

235 tons, junior-senior high school, East Park, N. Y.

225 tons, turbine room framing, Consumers Power Co., Comstock, Mich.



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84 Hours Make One Weak

■ We recently ran across these rules for employes, as posted in a Chicago department store back in the 1880's.

1. Store must be open from 6 A.M. to 9 P.M. the year 'round.

2. Store must be swept, counters, shelves and showcases dusted; lamps trimmed, filled and chimneys cleaned; pens made; doors and windows opened; a pail of water and a bucket of coal brought in before breakfast.

3. The store must not be opened on the Sabbath unless necessary, and then only for a few minutes.

4. The employe who is in the habit of smoking Spanish cigars, being shaved at the barber's, going to dances and other places of amusement will assuredly give his employer reason to be suspicious of his integrity and honesty.

5. Men employes are given one evening a week for courting

and two if they go to a prayer meeting.

6. After fourteen hours in the store, the leisure hours should be spent for the most part reading.

Personally, we're afraid that after a 14 hour stretch like that we might be inclined to droop over the nearest bar for a short nickel beer.

Deserved Popularity

■ We often get hurry calls for an extra copy of STEEL and have perfected a well-oiled machine for having the copy on the frantic subscriber's desk before he can say Franklin D. Roosevelt Jones. Usual reason for the pliant request is such as came from Standard Conveyor Co. last week: *This particular issue proved so popular that it only remained on the writers desk a few minutes and has disappeared from the office entirely.*

A Real Show

■ Next week, at Convention Hall in Detroit the American Society of Tool Engineers will hold their Machine and Tool Progress Exhibition, a preview of which is given this week beginning on page 38. Well over 200 exhibitors will be all set up and ready to show their wares at 9 A.M. Tuesday and among them will be STEEL, keeping house in booth A-60. We'll look for you.

Thank You, Mah Friends

■ A friendly little pat on our sway back this week from Electric Machinery Mfg. Co., Minniehapolis: *We enjoy* STEEL *for its up-to-date information, and we particularly like the section, "Mirrors of Motordom".*

STEEL With Us?

■ With the increase in the use of metered mail, slogan-makers are having a swell time. Comes a letter this week from *CUE* magazine with this very tricky remark on their metered envelope: *Thank CUE for a Lovely Evening.* We've been pretty well satisfied with STEEL *Is Modern* but now we have ideas. Such as *In the* STEEL *of the Night or At* $4.00 *a Year It's a* STEEL.

7 Months

■ Please just turn the page if we bore you, but one of you proud fathers will surely want to know that Ann is now sporting three beautiful white teeth and a tremendous appetite for spinach, which practically makes her a genius, doesn't it?

—SHRDLU

200 tons, school, East Pembrook, N. Y.; bids March 9.

200 tons, apartment houses, English Village Inc., Cranford, N. J.

200 tons, East Side high school, South Bend, Ind.; bids in.

189 tons, steel girder crossing, Spokane county, Washington; bids opened.

150 tons, bridge, Bernardston-Greenfield, Mass.; bids March 21, department of public works, Boston.

135 tons, bridges, specification 1196-D, bureau of reclamation, Granby, Colo.

125 tons, underpass, specification 1195-D, bureau of reclamation, Smithson, Calif.

115 tons, service facilities, Henry Hudson parkway, New York city parkway authority.

115 tons, supports, Standard Oil Co., Whiting, Ind.

115 tons, boiler sections, North Beach airport, treasury department, New York.

110 tons, state bridges, Sandgate, Vt.

105 tons, undercrossing of Southern Pacific Co. tracks, Riverside county, California; bids opened.

Unstated, seven fish screens for Roza project, Washington state; Steel Construction Co., Portland, low.

Unstated, pressure gates, hoists, hangers, etc. for Fresno dam, Milk river project, Montana; bids to Denver March 14; Spec. 1198-D.

Unstated, 12 gate frames, Coulee dam project, to Denver, March 16, Spec. 836.

Unstated tonnage, state normal school, Fredonia, N. Y.; bids postponed until March 30.

Reinforcing

Reinforcing Bar Prices, Page 85

New York—While small-lot buying continues fairly active, few large contracts for reinforcing steel are noted, and prices are inclined to strengthen under current conditions. Inquiry is light, but includes 325 tons for a Delaware Aqueduct section, Ulster county, New York, closing March 14. Bridge and highway work in the east is unusually small for this period.

Pittsburgh—Reinforcing bar markets are in fairly good condition with prices firm in most sections. This condition has slowed up place-

Concrete Bars Compared

	Tons
Week ended March 4	16,578
Week ended Feb. 25	6,940
Week ended Feb. 18	4,302
This week, 1938	2,640
Weekly average, year, 1938	6,959
Weekly average, 1939	13,518
Weekly average, February	8,268
Total to date, 1938	48,265
Total to date, 1939	108,121

Includes awards of 100 tons or more.

ments, since contractors are banking on past experience and are holding off, hoping for a break in prices. Since there are few large awards pending, the size of current tonnage indicates a well spread recovery in activity. There is an indication that some producers are anxious to increase the base prices, now quoted at 2.05c, Pittsburgh, in an attempt to raise current going levels. There is little likelihood that this will succeed. However, the expected upward trend in awards from public sources through March is expected to have a stiffening influence on quotations.

Cleveland—Reinforcing bar awards remain restricted to miscellaneous small tonnages. Private work continues dull and there is a temporary lag in inquiries from public sources. Prices have failed to firm, with operations restricted among most fabricators. Fabricators look for an improvement in demand during the next 30 days, with awards from public sources again playing a leading part.

Chicago — A temporary quietness currently exists. Unfavorable construction weather is said to be holding back a number of closings, while new projects are few. Producers view prospects with confidence, as considerable tonnage is seen in jobs expected to be active later this month. The Chicago subway is one of the main features of the present market, but formal awards of concrete bar tonnages have not yet been announced on several of the sections.

Boston—Reinforcing steel buying is confined mostly to small lots. Pending aggregate tonnage is estimated at less than 2500 tons, bridge and roadway needs being light. Taking several hundred tons, a flood wall, Springfield, Mass., also calls for 1500 tons of steel piling. Concrete bar prices continue weak.

Reinforcing Steel Awards

9381 tons, units 3 and 4, Lake Washington bridge, Seattle, Wash., to unnamed interests.

1695 tons, supply store house, specification 8742, Mare Island, Calif., navy yard, to Gilmore Fabricators Inc., San Francisco.

749 tons, three viaducts on Lake street, San Francisco, in connection with Golden Gate bridge, to Soule Steel Co., San Francisco.

535 tons, sewage disposal plant, Bowery Bay, Queens, N. Y., to Jones & Laughlin Steel Corp., Pittsburgh; through Tulley & Dinapoli Inc., New York.

521 tons, North Figueroa street bridge, Los Angeles, to unnamed interest.

500 tons, Mahoning dam, Dayton, Pa., to Bethlehem Steel Co., Bethlehem, Pa., instead of Jones & Laughlin Steel Corp., Pittsburgh, as previously reported; through Dravo Corp., Pittsburgh.

400 tons, addition to Coca-Cola plant, East Fourth street, Los Angeles, to unnamed interest.

370 tons, steel sheet piling, East River drive, New York, to Jones & Laughlin Steel Corp., Pittsburgh; through A. W. Hazel Inc., New York.

350 tons, crossing near Turlock, Stanislaus county, California, to Soule Steel Co., San Francisco.

299 tons, Samuel Gompers trade school, San Francisco, to Truscon Steel Co., San Francisco.

275 tons, mesh and bars, approach to Lincoln tunnel, Weehawken, N. J., to Stulz-Sickles Co., New York; through J. P. Scanlon Co., Newark, N. J.

250 tons, bridge over Ohio river, Owensboro, Ky., to Laclede Steel Co., St. Louis; through Hunter Steel Co., Pittsburgh.

250 tons, seven-story apartment, Ocean and Atizona avenue, Santa Monica, Calif., to unnamed interest.

210 tons, state span Nehalem river, Oreg., to unstated Portland jobbers.

175 tons, school, Cato, N. Y., to Truscon Steel Co., Buffalo.

172 tons, McGilvrey hall, Kent State University, to Carnegie-Illinois Steel Corp., Pittsburgh; through Carmichael Construction Co., Akron, O.

151 tons, state overcrossing Albany, Oreg., to unstated interests.

140 tons, treasury department, schedules 51,633 and 51,954, Los Angeles, to Judson Steel Corp., San Francisco.

129 tons, treasury department, schedule

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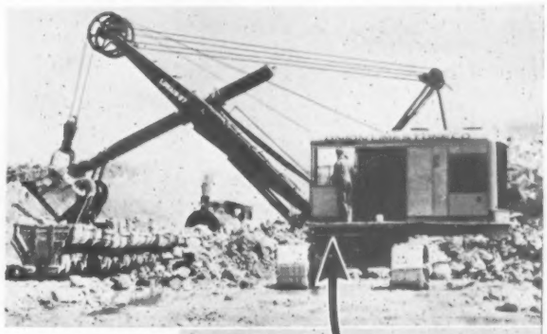
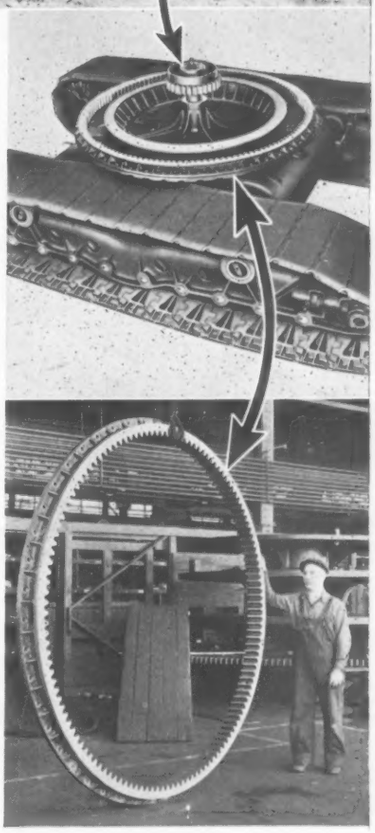
PASSES A DAY





No part of a power shovel is subjected to such continual heavy-duty service as the swing mechanism. The machine will average 1,000 swings back and forth in an ordinary day's run. Sudden starts and stops . . . quick reverses . . . are part of the abusive treatment the mechanism must take.

To stand this strain Thew Lorain shovels use Farrel generated internal gears for the large ring gear mounted on top of the crawler base. These gears are built for long life under the toughest conditions. They are smooth in action and make possible a more compact swing mechanism.

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The Farrel Internal Gear used for the swing mechanism of the Thew Lorain shovel as shown above has 132 generated spur teeth, 1½ DP, 4⅝" face, 90.250" inside diameter, and meshes with 10-tooth pinion at 42.000" centers.

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51,233, Los Angeles, to Judson Steel Corp., San Francisco.

116 tons, three bridges for bureau of public roads, Tehama county, California, to Truscon Steel Co., San Francisco.

109 tons, high school, Eureka, Calif., to W. S. Wetnehall Co., San Francisco.

102 tons, sewage treatment plant, San Leandro, Calif., to W. C. Hauck & Co., San Francisco.

100 tons, administration building, Vaucluse home, San Diego county, California, to unnamed interest.

100 tons, WPA requirements, Cleveland, to Builders Structural Steel Co., Cleveland.

Reinforcing Steel Pending

700 tons, postoffice garage, St. Louis; J. S. Alberici, St. Louis, low on general contract.

700 tons, water and light plant additions, Owensboro, Ky.

679 tons, including concrete piers, overcrossing University avenue and Southern Pacific tracks, Berkeley, Calif.; bids opened.

610 tons, steam plant at Avon and at Martinez, Calif., for Pacific Gas & Electric Co.; Dinwiddie Construction Co., Crocker building, San Francisco, low.

600 tons, sewer, St. Joseph, Mo.

600 tons, new building, Pratt-Whitney Co., Hartford, Conn.

510 tons, cold storage building, John Morrell & Co., Ottumwa, Iowa; Stark building Co., Cedar Rapids, Iowa, low.

500 tons, post office and court house, Fresno, Calif.; bids postponed from Feb. 24 to March 7.

435 tons, city water reservoir, Eugene, Oreg.; bids in.

325 tons, contract 316, Delaware aqueduct, Ulster county, New York; bids March 14, board of water supply, New York.

?00 tons, barracks, Fort Jay, N. Y.

250 tons, piers, Raritan river bridge, Sayerville-Woodbridge, N. J.; bids March 22.

200 tons, rayon mill, Celanese Corp., Narrows, Va.

200 tons, film exchange, Chicago.

177 tons, sewage treatment plant, Peru, Ind.; Haines & Haines, Dowagiac, Mich., low.

170 tons, relief sewer, West Newark, N. J.

150 tons, plant, Quarantine building, Hoboken, N. J.

145 tons, school, Weehawken, N. J.

142 tons, civic auditorium, Santa Cruz, Calif.; Millikin Construction Co., low.

140 tons, plus 400 tons of sheet piling, for city of Cincinnati flood protection at waterworks; bids in.

123 tons, courthouse, Burlington, Iowa; Paul Steenberg, St. Paul, low bidder.

108 tons, South Damen street improvement, Chicago; L. B. Strandberg, Chicago, low.

103 tons, sewage treatment plant, Sturgeon Bay, Wis.

100 tons, dormitories, Brookings, S. Dak.

100 tons, natural history museum, Minneapolis.

100 tons, undercrossing of Southern Pacific tracks, Riverside county, California; bids opened.

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Pig Iron

Pig Iron Prices, Page 86

Pittsburgh—Pig iron demand and production are steady. Changes in foundry operations are slight. Among the more active plants sanitary ware and heating equipment makers report production ahead of shipments, with warehouse stocks being increased. New pig iron business is mostly in small lots for prompt shipment. Twenty-one blast furnaces are active in the district, with prospect of another being added within the next two weeks.

Cleveland — February shipments were slightly ahead of January on a daily average basis. Releases from heating equipment foundries are outstanding, while shipments to jobbing plants reflect slightly lower operations of this group.

Chicago—February wound up as expected, with daily rate of shipments improved over previous month, but month's total off 5 to 10 per cent. Shipments of coke were on a par with January. Present rate of shipping orders being received leads sellers to estimate March shipments of iron will exceed February, with possibility of best figures for 14 months.

Philadelphia—Several sellers have followed the lead of Alan Wood Steel Co. in reaffirming prices for second quarter although some are not expected to make formal announcement. The melt is holding up well, and February pig iron shipments on the average were slightly ahead of January. New business is slow.

Boston—A reduction of 75 cents a ton has been made on all grades of pig iron by Mystic Iron Works,

Everett, Mass., bringing base prices down to those prevailing in eastern Pennsylvania. While the trend is slightly upward, first quarter pig iron business so far has been disappointing. Foundry melt has improved spottily, being confined largely to producers of machine tool castings and industrial equipment.

Buffalo — Deliveries continue steady, with improved consumption and low inventories counted on to stimulate business this month. Melters still refrain from ordering beyond early needs. Foundry operations average three days a week, although individual rates vary widely. Pig iron production continues 57 per cent of capacity.

Cincinnati—Pig iron sellers have opened books for second quarter at unchanged prices. Some contracting was done coincident with announcement of prices. This was covering for minimum needs under well-established customer-dealer relationships.

St. Louis—Despite some decrease late in the month February shipments were only slightly below January. Foundry operations have receded moderately since early February. Jobbing plants are working three to four days a week, largely on old orders, with new business disappointing. Stove plant operations are steady.

Scrap

Scrap Prices, Page 88

Pittsburgh—Scrap prices are firm here despite absence of new mill buying. With open-hearth grades relatively scarce and short orders still outstanding, prices offered by mills do not interest brokers. Scrap has been coming out in fair quantities, thereby reducing the tonnage due against old orders. Railroad offerings are among the lightest in recent months.

Cleveland — Most buying is by dealers but consumer activity is expected this month. Railroad lists are small. It is understood New York Central railroad heavy melting steel went to a southern Ohio mill at $15.50, up 25 cents. Heavy melting steel has been advanced 25 cents here and at Youngstown as holders refuse to sell at the former price.

Chicago—Scrap prices continue steady, although withdrawal from the market of the principal buyer for at least five weeks, following a recent purchase, was expected to have a depressing effect. However, consumption continues relatively active and with supplies of No. 1 steel none too plentiful at current prices, the market is firm at $14 to $14.50. Prices of a few other grades are higher.

Boston—In view of light domestic buying iron and steel scrap prices are holding relatively firm. Heavy breakable cast is off 25 to 50 cents, but forge flashings and skeleton are stronger. Heavy melting steel purchasing by district consumers is nil, with prices untested. For export the bulk of No. 1 steel is bringing $14 dock. Most activity continues in buying against old export orders.

New York—Japanese purchases of scrap are restricted by reluctance of brokers to sell at prices offered which are 25 to 50 cents under last figures paid. Domestic buying has improved spottily, although shipments from this immediate district still lag. Foundry grades also are slightly more active. Domestic prices generally are unchanged.

Buffalo—Activity is confined to restricted shipments to consumers against old orders. One mill partially has lifted an embargo on receipts of No. 2 steel. New buying is marking time, with No. 1 steel nominally unchanged at $13.75 to $14.25.

Philadelphia — Cast scrap has weakened on an announcement that one mill will no longer use this grade. Other grades are steady with business done in No. 1 steel at $15.50 and in No. 2 at $13.50. March list of 3400 tons of new compressed sheets offered by Edw. G. Budd Mfg.

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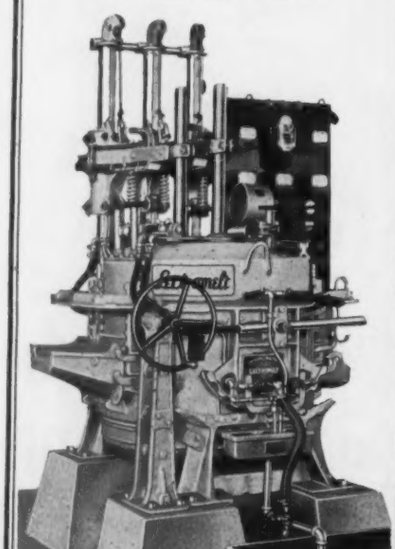

Illustration shows new 500 pound capacity 3 phase direct arc LECTROMELT furnace installed in jobbing steel foundry.

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Co. brought $14, f.o.b. plant. Some tendency is noted toward use of lighter grades of scrap, with at least two mills charging turnings along with heavier material. The navy is offering additional vessels for scrap March 14 and 24, involving about 20,000 tons of material.

Detroit — Current quotations are unchanged, lists sold recently bringing approximately the going prices. Bundles in some cases commanded 10 to 15 cents a ton less, with borings and turnings selling for a like amount above present figures. Heavy breakable cast is up 50 cents. No. 1 machinery cast shows the first activity in five or six months.

Cincinnati—Scrap is quiet, with dealers' prices showing little change. Mills are inactive in the market, although shipments to one interest against contract are steady in fair volume. Collections are slow.

Toronto, Ont.—Demand is quieter, but mills continue to take delivery of heavy melting steel and some turnings. Machinery cast is in good demand but supplies of No. 1 material are limited. Some local dealers are increasing supplies on docks in anticipation of opening of the navigation season.

Warehouse

Warehouse Prices, Page 87

Cleveland — While February shipments declined, the daily average rate was higher than in January. Orders are fairly numerous but small individually, indicating hand-to-mouth buying. A seasonal rise in demand is looked for this month.

Chicago—Sales pursue a sidewise trend, following a recent tapering in orders. Little change is expected until about the middle of this month, when an upturn is counted on to bring business to January levels and possibly better.

Boston—Demand holds to the lower rate which developed about mid-January. However, jobbers in Connecticut and other districts outside the Boston metropolitan area appear to be doing slightly better, with demand well diversified. Prices are none too steady on some products, notably galvanized sheets.

New York—With demand well diversified, warehouse volume last month compared favorably with January on a daily basis, the total being affected by the shorter month and holidays. Alloy and specialty products make relatively the best showing, with heavy products inclined to lag.

Philadelphia — Demand is broadening slowly, but individual orders

14 15 16 17 18 MARCH 14 15 16 17 18

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are small. An advance in galvanized sheets is being considered. In effect, jobbers are quoting mill prices on cold-finished bars.

Buffalo — Sentiment in the warehouse trade has improved lately, despite absence of a major change in February business. An upward trend is looked for in coming weeks.

Cincinnati—Jobbers were pleased with February tonnage, which compared favorably with January. Prices are firm and unchanged, even on galvanized on which mills recently withdrew functional allowances.

St. Louis — Unfavorable weather has retarded business, but a seasonal pickup in demand from miscellaneous manufacturers is looked for early this month. Buying of railroad shop materials is holding up surprisingly well.

Seattle — Sales show an increase over last month but spring buying has not yet given impetus to turnover. Material improvement is expected shortly with better outside working conditions.

Tin Plate

Tin Plate Prices, Page 84

Following a temporary dip tin plate production has moved back to close to 55 per cent.

February business was somewhat disappointing in that tonnage showed little or no improvement over January. A better month is anticipated for March, with still better activity in prospect for April and May. General line cans and miscellaneous outlets still provide most of current demand, although some packers' can business is appearing.

Little interest is being shown in prices, since extension of current levels has been expected.

Ferroalloys

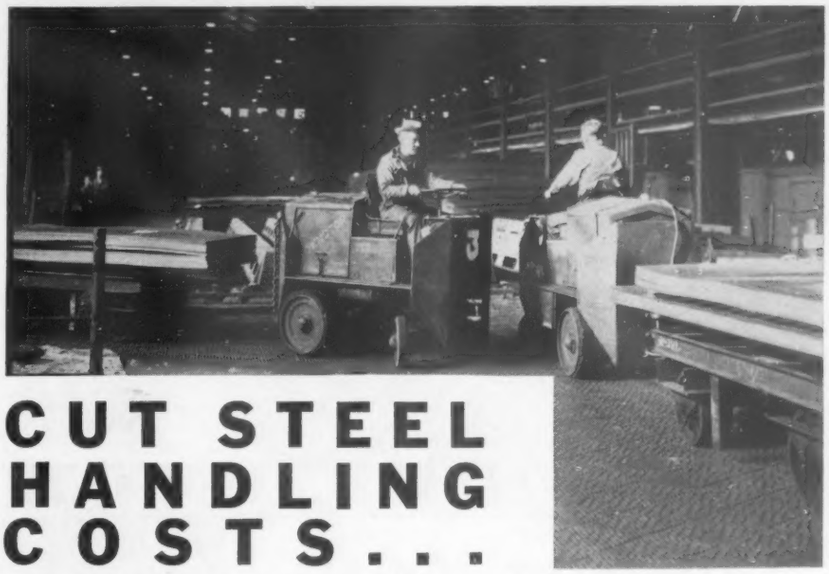
Ferroalloy Prices, Page 86

New York—While second quarter books on ferromanganese will probably not be opened for another week or ten days, opinion is prices will be reaffirmed. This would extend the market of $80 duty paid, Atlantic and Gulf ports, which was put into effect around the middle of January.

A stable price outlook appears to apply to all leading ferroalloys. Some tungsten items may fluctuate, in line with varying ore prices and there may be some other exceptions, but as to most items, no change is expected in the near future.

Ferromanganese shipments this

TOWMOTORS CLEVELAND



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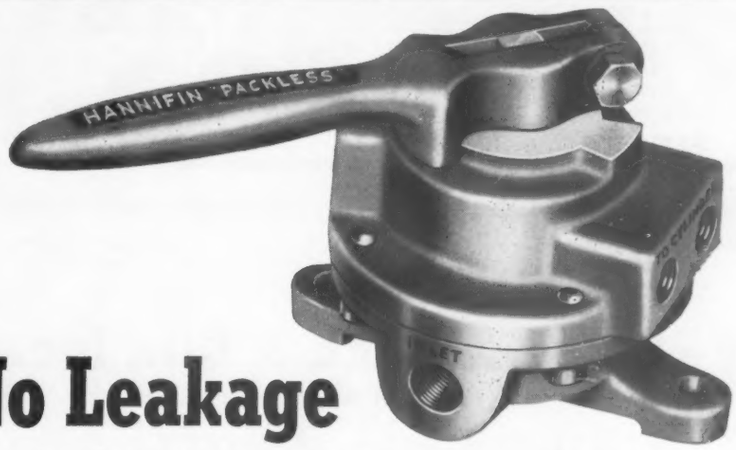

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month are expected to exceed those of February, which, in turn, were comparable with January shipments. Much the same situation applies to domestic spiegeleisen, with sellers anticipating a gain in March not only because the month will be longer than February, but because the trend in steelmaking operations is slightly upward.

Domestic spiegeleisen, 19 to 21 per cent, is holding at $28, Palmerton, Pa., and 26 to 28 per cent, at $33, prices which have held since early last summer.

Steel Imports Light

Philadelphia — Importation of 1500 tons of chrome ore from South Africa featured receipts here during the week ended Feb. 25. Other imports were confined to 100 tons structural shapes, 41 tons steel bars and 42 tons bands from Belgium.

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Steel in Europe

Foreign Steel Prices, Page 87

London — (*By Cable*) — Market prospects in Great Britain are improving. Inquiries for foundry pig iron are beginning to expand and semifinished producers are well occupied. Demand for light steel products is heavier. Domestic demand for sheets and galvanized sheets is brisk, due to needs for the government defense program. Greater activity is evident in the ore and scrap trade. Tin plate continues one of the most active products. Austin Motor Works has a program for plant enlargement to cost £4,000,000.

The Continent reports a slight revival in export trade, especially in semifinished steel. The European tube cartel has been renewed.

Lloyds underwriters have reduced war risk insurance rates on all trans-Atlantic shipments of machinery 40 per cent. New rate is 1½ shillings per 100 pounds instead of 2½ shillings.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 85

Bolt, nut and rivet business generally is well maintained, with further improvement expected in March. Building requirements and needs of the automobile industry are counted on to improve this month, while railroad specifications appear more promising. Outstanding business pending in track accessories is the New York Central inquiry. Shipbuilding involves considerable prospective work as well as a steady flow of tonnage for construction under contract. While price irregularities have not been corrected entirely, the steadier tone is regarded by producers as encouraging.

Steel Construction Manual Is Revised

■ American Institute of Steel Construction, 200 Madison avenue, New York, has issued the second printing of the third edition of its *Manual of Steel Construction*. This is the standard handbook for engineers and builders.

Some minor revisions have been made, including personnel changes in the technical advisory board; minor changes in text regarding structural tees; table added on dimensions and properties, H piles; revisions relating to camberings of rolled beams; revisions in rolling and cutting tolerances, camber and sweep; revisions in section modulus tables.

Nonferrous Metals

New York—Strength in lead, reflecting heavy consumer demand, featured developments in nonferrous metals last week. All markets, however, showed signs of improvement in line with the expected pick-up in spring.

Copper—Sales in the domestic market increased to an average of over 1000 tons per day, the best showing since mid-October. Export copper rose to around 10.15c, c.i.f. European ports, the best level attained in several weeks. Brass mill operations have been raised to has been stepped up to a rate of between 55 and 60 per cent of capacity. Resale electrolytic copper fluctuated between 10.55c and 10.75c but all first hands continued to quote 11.25c, Connecticut.

Lead—Leading sellers booked more than their day's intakes on several occasions but the relatively low level in London prevented an advance in prices here. All sellers continued to quote on the basis of 4.60c, East St. Louis.

Zinc—Sentiment in the market has been buoyed by the steady rise in galvanized sheet output to the 60 per cent level and in the steady rate of shipments which are well in excess of new business. Prices held at 4.50c, East St. Louis, for prime western with the London market still acting as an effective ceiling.

Tin—Straits tin prices continued to fluctuate within a narrow range last week with spot being quoted from 45.70c to 46.00c. With tin plate mill operations rising to about 55 per cent of capacity, the statistical report, showing an increase of 1005 tons in world visible supply plus carryovers, had little outward effect on the market.

Iron Ore

Iron Ore Prices, Page 88

New York—Livelier interest reported recently in chrome ore continues, with some fair tonnages being placed in metallurgical, chemical and refractory grades. Some consumers are anticipating their requirements a year ahead. Chrome ore prices are unchanged, but strong. Little activity is noted in imported iron and manganese ores. There was some buying of foreign manganese ore around the first of the year, but business subsequently has been light.

Equipment

Chicago—Machine tools have been in better demand the past week. Orders in the immediate locality are small, but country buying is improved considerably, some sellers state. Inquiries continue to come in at an unchanged rate, and in the meantime a large amount of work is actively pending. No particular industry is outstanding in its requirements, the present movement being broadly diversified.

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

Feb.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
25	11.25	11.37½	10.15	45.75	45.75	4.75	4.60	4.50	20.00	11.25	35.00
27	11.25	11.37½	10.25	45.70	45.70	4.75	4.60	4.50	20.00	11.25	35.00
28	11.25	11.37½	10.30	46.00	46.00	4.75	4.60	4.50	20.00	11.25	35.00
March											
1	11.25	11.37½	10.37½	45.87½	45.87½	4.75	4.60	4.50	20.00	11.25	35.00
2	11.25	11.37½	10.37½	45.75	45.75	4.75	4.60	4.50	20.00	11.25	35.00
3	11.25	11.37½	10.47½	46.00	46.00	4.75	4.60	4.50	20.00	11.25	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.25c Conn. copper

Sheets

Yellow brass (high)	17.31
Copper, hot rolled	19.37½
Lead, cut to jobbers	8.00
Zinc, 100 lb. base	9.75

Tubes

High yellow brass	20.06
Seamless copper	19.87½

Rods

High yellow brass	12.62
Copper, hot rolled	15.87½

Anodes

Copper, untrimmed	16.62½

Wire

Yellow brass (high)	17.56

OLD METALS

Nom. Del. Buying Prices

No. 1 Composition Red Brass

New York	6.37½-6.60
Cleveland	6.75-7.00
Chicago	6.25-6.50
St. Louis	6.00-6.25

Heavy Copper and Wire

New York, No. 1	8.25-8.37½
Cleveland, No. 1	8.00-8.25
Chicago, No. 1	8.00-8.25
St. Louis	7.75-8.00

Composition Brass Borings

New York	5.62½-5.87½

Light Copper

New York	6.75-7.00
Cleveland	6.25-6.50
Chicago	6.37½-6.62½
St. Louis	6.25-6.50

Light Brass

Cleveland	3.25-3.50
Chicago	4.12½-4.37½
St. Louis	3.50-3.75

Lead

New York	4.10-4.35
Cleveland	3.50-3.75
Chicago	3.50-3.75
St. Louis	3.25-3.50

Zinc

New York	2.50-2.62½
Cleveland	2.00-2.25
St. Louis	2.00-2.25

Aluminum

Borings, Cleveland	6.25-6.50
Mixed, cast, Cleveland	6.75-7.00
Clips, soft, Cleveland	14.75-15.00
Mixed cast, St. Louis	7.00-7.25

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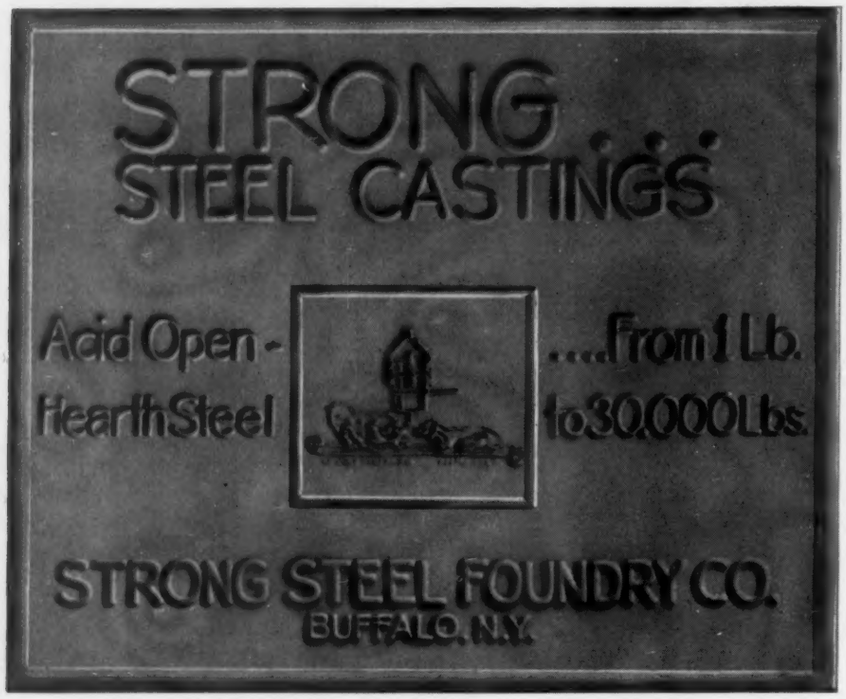
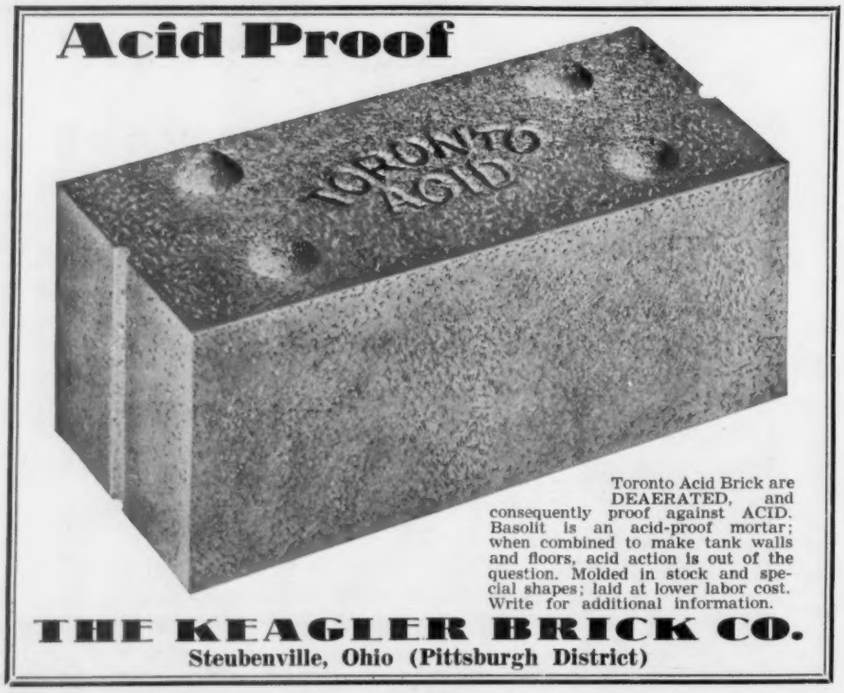
Seattle — Public works projects and municipal requirements call for a miscellaneous variety of machinery and equipment, electrical and automotive predominating. Mining operators are beginning to survey their seasonal needs while diesel engine plants are busy with orders for power plants for small fishing craft. Seattle will open bids March 13 for furnishing three 1000-kva transformers. American Transformer Co. is low at $42,525 for three transformers for the Bonneville substation at Eugene, Oreg. WPA, Seattle, has opened bids for power hammers, transformers and miscellaneous other supplies. Seattle has purchased flow regulating equipment and tide gates from Brown & Brown Inc., Lima, O. Industrial Electric Co., Seattle, is low at $12,039 for furnishing diesel power plant and equipment for Lewis county public utility district, Chehalis, Wash.

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Construction and Enterprise

Ohio

BELLEFONTAINE, O. — City, John Thatcher, service director, is accepting bids until noon, March 14, on Contract A, an addition to its light plant; and on Contract B, a tar tank for its gas plant.

F. M. Baxley, chief utilities engineer.

CINCINNATI—Century Machine Co. will let contracts soon for construction of a one-story 100 x 140-foot factory addition. Tietig & Lee, Cincinnati, architects.

CUYAHOGA FALLS, O.—City, Kenneth Ewart, service director, will probably receive bids soon on construction of $305,000 sewage disposal system, including 2,000,000-gallon capacity treatment plant, chemical treating, and sludge incinerator plant. E. D. Barstow, Akron, O., consulting engineer.

EAST LIVERPOOL, O.—City, James Hall, service director, takes bids due at noon, March 9, on construction of a pumping station in a waterworks improvement program. J. N. Chester Engineering Co., Pittsburgh, consultant.

GREEN SPRINGS, O.—Village, Ira Young, mayor, plans to start work immediately on construction of sewage disposal system and sewers to cost approximately $75,956. Consulting engineers, H. P. Jones & Co., Toledo, O.

KENT, O.—City, W. K. Harvey, mayor, has completed survey and contemplates making water system improvements to include new 250,000-gallon storage tanks, lines and standpipe. Total cost estimated at $103,000. Consulting engineer, R. F. MacDowell, Cleveland.

LANCASTER, O.—City, A. F. Raab, service director, is receiving bids due at noon, March 15 on Contract E in construction of a sewage treatment plant. Consultants, Burgess & Niple, Columbus, O.

MINERAL RIDGE, O.—Village, care of county commissioners, contemplates construction of a water supply system and a sewage disposal system to cost approximately $1,316,173. Probably will take referendum vote and apply for WPA grant. Harry Dittmer, Warren, O., county engineer.

MONTPELIER, O.—Village, J. M. Hoover, superintendent of utilities, contemplates building a water softening plant including lime water softener, filters, mixing and settling tanks and sludge collecting equipment etc., costing total of $74,000. Should be ready for bids about March 8. H. P. Jones Co., Toledo, O., consultant. (Noted Nov. 14.)

Connecticut

BRIDGEPORT, CONN.—City proposes to modernize its Bostwick avenue sewage treatment plant at cost of $700,000. Fuller & McClintock, New York, engineers.

New York

OSSINING, N. Y.—Village takes bids to March 21 on construction of a sewage treatment plant costing $135,000. J. C. Harding, New York, consulting engineer.

ROCHESTER, N. Y.—Bausch & Lomb Optical Co. has let a $50,000 contract to John B. Pike & Son for construction of an addition to its plant.

New Jersey

MAHWAH, N. J.—American Brake

Shoe & Foundry Co. has let contract to Austin Co., New York, for constructing a one-story, 69 x 365-foot machine shop, storage and shipping building.

Pennsylvania

OIL CITY, PA.—Pennsylvania railroad, W. B. Wood, Pittsburgh, chief engineer, has let contract for constructing an engine house and machine shop estimated to cost $50,000, to Rust Engineering Co., Pittsburgh.

WIND GAP, PA.—Ross Common Bottling Co., A. Tehrich, president, Bethlehem, Pa., plans to build a bottling plant costing more than $40,000 with equipment.

Illinois

SILVIS, ILL.—City has plans under way for constructing a sewage disposal plant to cost $51,000. Consoer, Townsend & Quinlan, Chicago, consulting engineers.

Indiana

INDIANAPOLIS—L. & L. Mfg. Co. Inc. has been organized with 100 shares no par capital stock to manufacture and sell carburetors. Resident agent, Howard Linkert, 5456 North New Jersey street, Indianapolis.

Alabama

TALLADEGA, ALA.—City sanitary commission, W. L. Baker, president, proposes to expend $50,000 for improving its sewerage system and sewage treatment plant. J. W. Goodwin Engineering Co., Birmingham, Ala., consulting engineers.

District of Columbia

WASHINGTON—Navy department, bureau of supplies and accounts, takes bids until 10 a.m., March 14, on motor-driven miller bench (schedule 5648); and on milling machine (schedule 5649); and until March 17 on engine lathes (schedule 5657); and on electric bench-type drills (schedule 5665).

Kentucky

MCKEE, KY.—Jackson County Co-operative Corp., Ralph Siff, superintendent, has received a $188,000 REA allotment for erecting rural power transmission lines in three counties.

NEWPORT, KY.—Andrews Steel Co. plans an improvement program at one of its four plants here. Includes installation of shears, saws, cranes etc.

OWENSBORO, KY.—City takes bids until March 14 on Contracts 9, 10 and 11 in water project costing $400,000. Contracts include filtration building, power plant, filtering equipment and meters. Black & Veatch, Kansas City, Mo., consultants.

North Carolina

DURHAM, N. C.—American Tobacco Co. will start work within three weeks on a $200,000 addition to its power plant, electrical equipment to be furnished by General Electric Co., Schenectady, N. Y.; and steam equipment by Babcock & Wilcox Co., New York. General contract not yet awarded. Francisco & Jacobus, New York, architects.

HIGH POINT, N. C.—City, E. M. Knox, manager, receives bids March 15 for constructing a dam, power house and spillway. Includes machinery and equipment. Murray & Flood Inc., Winston-Salem, N. C., consulting engineers. (Noted Nov. 7.)

Tennessee

KNOXVILLE, TENN.—City plans to extend its transmission and distribution lines and build new power substations involving new transformers; total cost approximately $1,000,000. Burns & McDonnell Engineering Co., Kansas City, Mo., consulting engineers.

Missouri

PLEASANT HILL, MO.—City, J. A. Swift, mayor, will be ready for bids about March 20 on construction of a diesel generating plant and distribution system to cost total of $154,909. W. B. Rollins & Co., Kansas City, Mo., consulting engineer.

Arkansas

PINE BLUFF, ARK.—C. & L. Rural Electric Co-operative receives bids March 9 for construction of 165 miles rural electric power lines in three counties. Has $253,000 REA loan. Lund-Buxton

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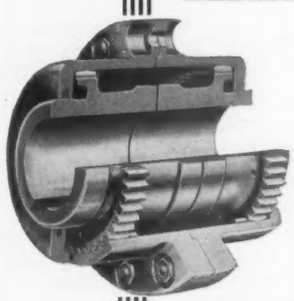
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Engineering Co., Little Rock, Ark., consultant. (Noted Feb. 20.)

Oklahoma

WAGONER, OKLA.—Verdigris River Hydroelectric Inc., care of Carl Mathews, Catoosa, Okla., has plans in progress for constructing a hydroelectric generating project costing $2,000,000 on the Verdigris river. Will include a 4000-foot power dam, a 10,000-kilowatt generating plant, substations and transmission lines.

Minnesota

APPLETON, MINN. — Village, Sibert Johnson, recorder, takes bids until 8 p.m., March 15, on furnishing materials for a complete iron removal plant, including pumps and lines, valves and electric controls. Certified check 5 per cent to accompany bids.

FARIBAULT, MINN.—Northern States Power Co., Minneapolis, during 1939 plans to expand capacities of its power substations, and improve its transmission and distributing lines.

MOORHEAD, MINN.—REA has allotted $270,000 to the Red River Valley Power co-operative, E. D. Anderson, president, to finance construction of 271 miles rural electric lines serving some 560 consumers. (Noted Feb. 6.)

Texas

LAMARQUE, TEX.—Galveston County Fresh Water Supply district No. 2, B. Inselman, Galveston, Tex., president, has plans for building wells, pumps, chlorinators and lines at cost of $69,500. H. G. Olmsted, engineer, care of owner.

YOAKUM, TEX.—Shell Petroleum Corp., St. Louis, plans to install motors and controls, air compressors, pumping machinery, conveyors etc., in proposed gasoline refinery costing an estimated $500,000.

North Dakota

DICKINSON, N. DAK.—City, D. D. Mars, auditor, takes bids to 2 p.m., March 27, on the construction of a sewage disposal plant and incidental work. Certified check 5 per cent to accompany bids. L. W. Viegel, Dickinson, engineer. (Noted Nov. 21.)

Nebraska

NEBRASKA CITY, NEBR.—Eastern Nebraska Public Power district, George W. Kline, secretary, Lincoln, Nebr., is receiving bids on project No. 3, consisting of construction of 152 miles rural lines in three counties. H. H. Henningsen Engineering Co., Omaha, Nebr., consultant.

NORTH PLATTE, NEBR.—City council will submit to voters at April 4 election a proposal to issue $360,000 revenue bonds to finance construction of an electric power distribution system.

Iowa

ANITA, IOWA—Village, C. F. Darrow, mayor, is accepting bids until 7:30 p.m., March 29, on construction of a power plant to cost about $110,000. Included are two diesel engine generators, switchboard, distribution system and auxiliary equipment. Young & Stanley, Muscatine, Iowa, consultants. (Noted Dec. 5.)

ATLANTIC, IOWA—City waterworks and electric light and power plant trustees, Jennie Weideman, secretary, take separate bids to 2 p.m., March 22 on sections 3, 4, 5 and 6 in plant improvement program. Certified check 5 per cent to accompany bids. Young & Stanley, Muscatine, Iowa, consulting engineers.

DES MOINES, IOWA—Oil Mill division, Swift & Co., Chicago, plans to install motors and controls, regulators, conveyors and power house in projected $350,000 processing mill.

OSKALOOSA, IOWA—Iowa Power & Light Co., Des Moines, Iowa, contemplates improving its distribution system here at cost of $40,000, altering its heating plant, $66,000, and improving its gas system, $8000.

ROCK RAPIDS, IOWA—City council, W. D. Carpenter, clerk, proposes to issue $36,500 bonds to finance construction of a municipal light and power plant.

SIOUX CITY, IOWA—Woodbury County Rural Electric co-operative is taking bids on construction of 119 miles rural electric power transmission lines costing $137,000. REA has allotted funds. Buell & Winter, Sioux City, consulting engineers. (Noted Feb. 13.)

Colorado

DENVER — Bureau of reclamation takes bids to March 15 for turbines, governors and auxiliary equipment for installation in Shasta power plant, Central Valley project, California. (Specification 831.)

New Mexico

ALBUQUERQUE, N. M.—Eaton Metal Products Co., Denver, Lewis Kohlhaas, local manager, has awarded general contract to Kilbourne L. House, Albuquerque, for constructing a plant to fabricate steel petroleum equipment.

Pacific Coast

LOS ANGELES—Steel Window Corp. recently was organized with $25,000 capital. Representative, G. L. Goldstein, attorney, 639 South Spring street, Los Angeles.

LOS ANGELES—Copper Products Co. has been formed with capital of $25,000. Attorney Arnold Praeger, 610 Rowan building, Los Angeles, representative.

LOS ANGELES—Reliance Steel Products Co. has been organized with 2500 shares capital stock by C. F. Calhoun, Thomas Neilan and H. P. Redgeway. Bernard Heimenz, 740 South Broadway, Los Angeles, representative.

LOS ANGELES—United States Rubber Co. has awarded contracts for construction of an addition to its storage building, one-story, 261 x 271 feet, with steel frame, steel windows and doors, and costing $90,000. Work is to begin immediately.

MERCED, CALIF.—Yosemite Portland Cement Co. will install new separators, batch-weighing devices, crushing equipment and kiln improvements in its plant at cost of more than $100,000.

SAN JOSE, CALIF.—San Jose Water Works plans an expansion during 1939 which will involve new mains and pumping equipment costing nearly $300,000. J. W. Ford, San Jose, engineer.

ISSAQUAH, WASH.—City will receive bids on materials for construction of a proposed sewage disposal plant.

VANCOUVER, WASH.—City is receiving bids on a new chlorinator for its water plant and various electrical equipment for the water system.

Canada

PRINCE RUPERT, B. C.—Northern British Columbia Power Co. Ltd., J. J. Little, manager, plans to build a power house at Shawatlans lake. Will contain two 5000-horsepower units and cost about $750,000.

FLIN FLAN, MAN.—Hudson Bay Mining & Smelting Co. Ltd., Winnipeg, has awarded contract to Dominion Bridge Ltd., Winnipeg, for fabricating and erecting a steel head house.

TORONTO, ONT.—Hydroelectric power commission of Ontario, R. T. Jeffrey, Toronto, engineer, plans to build a substation and install equipment in York township at cost of $750,000.

SASKATOON, SASK.—City, C. Niderost, mayor, is taking bids until March 20 on two centrifugal pumps and generating and lighting equipment.

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READER Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Distribution Key Factor

To the Editor:

Fundamentally, I believe in such old economic laws as supply and demand, the right of money to earn interest, and in the capitalistic system in general, and these remarks are addressed to those who believe capitalism to be the best economic arrangement that has so far been developed or devised to regulate the economic relationships of mankind. It is the outgrowth of centuries of trial and error, and is based on the old law of the survival of the fittest. Under capitalism the average standard of living has been raised; literature, science, and the arts have prospered; inventions have made luxuries commonplace; and the minds of men have been broadened. Civilization has had its greatest advancement in capitalistic countries.

Theoretically, under this system every man gets what he works for to the extent of his ability to compete successfully with other people who want the same thing. Practically, this does not always hold true. Ability and the willingness to work are not always justly rewarded. And capital is not always justly compensated. So, for the sake of the discussion, let us assume that there is something wrong with our present economic system.

I would acquit politics. Politics can and does influence current economic conditions, but the business cycle, periods of depression and recovery, moves along its course regardless of the political party in power. Moreover, regardless of current business conditions, the injustices of capitalism mentioned above are apparent.

Capitalism is designed to promote production and accumulation. "Big Business" does these things in a big way. But capitalism has not yet acquired sufficient incentive to accomplish distribution in a big way. This is the situation that is causing the trouble, the reason labor and capital are not always rewarded.

Millions of people today and everyday could double or triple their consumption of merchandise if business could be induced to supply them. But under the present set-up the incentive is not always present to supply this potential market. We have "gone to town" so far as production is concerned, but we are still in the hinterland when it comes to distribution.

Is some modification of capitalism needed to foster and promote the distribution phase of the system? If so, capital must make this adjustment itself. Government might stimulate distribution by providing some kind of royalty in the form of reduced taxes based upon dollar sales per unit of capital invested, but such a statutory law would be only an expedient.

Economic Laws Unwritten

The universally operative laws of our economic system are unwritten and do not depend upon government for enforcement. The profit motive is its mainspring. This is sometimes camouflaged by the term "service." But service is not rendered by business unless a profit, either direct or indirect, is expected.

How to inject the profit motive into the distribution phase of our economic system in a big way is the question that has us stumped today. Perhaps it will be answered in the next five, ten or hundred years. In the meantime, we can only continue to experiment.

In a country like ours, with practically unlimited natural resources, the answer to the above question will automatically solve the unemployment problem. The answer will bring about a free exchange of capital, labor and material which for some satanic reason is not prevalent today.

A thought that suggests itself is

(*Please turn to Page* 98)

Figures Tell Own Story

To the Editor:

I have read the interesting editorial on page 30 of STEEL, Feb. 27, which refers, I assume, to our recent press release that the steel industry will spend about $126,000,000 for plant improvements in 1939.

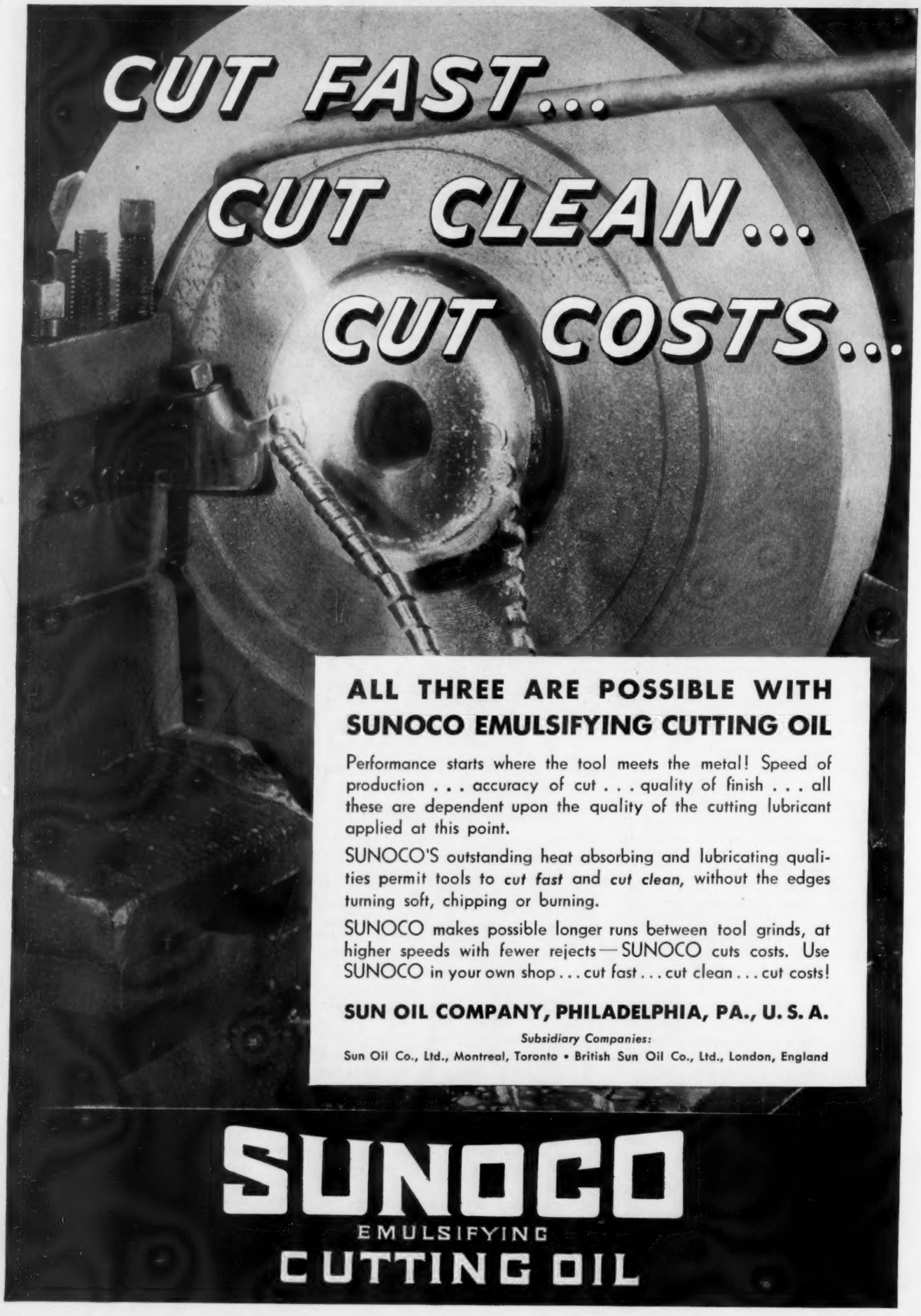
While I can well understand and, in general, sympathize with your reasons for urging "interpretation" of figures, we have felt that the proper position for the institute to take is to confine itself to presenting the facts. To do otherwise almost inevitably would lay the institute open to the charge of disseminating biased propaganda. In most cases the facts which we publish speak for themselves or lend themselves to intelligent interpretation by anyone who cares to do so.

For example, one newspaper in commenting editorially upon the expenditure figures says: "While the expenditures planned are less than in preceding years they make a tidy sum, and what is more significant, they indicate that the steel companies now have their plants modernized to the limit and are ready for any calls that may be made upon them for production. What steel needs now is business. When the durable goods demands of the country start flowing there will be a far-reaching reduction in unemployment. The steel companies are ready to answer the call."

I believe that summarizes the real situation more realistically than your suggestion that the expenditures were less because of low earnings in the industry. A review of the record indicates that in recent years the steel industry has carried forward its program of improvements and modernization in the face of low earnings.

WALTER S. TOWER

Executive Secretary,
American Iron and Steel Institute,
New York.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